



NATURE MAGAZINE



MARCH 1926

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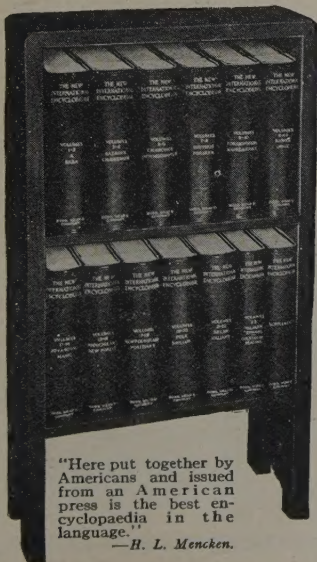
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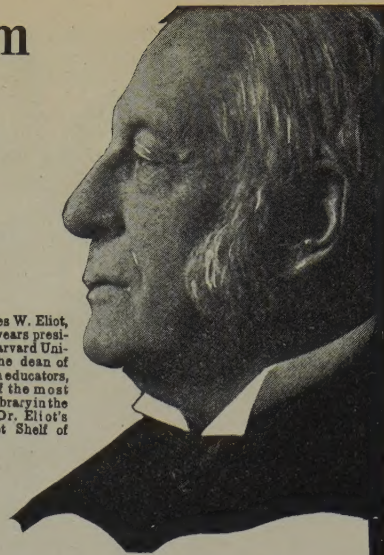
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New England Birds

Edward Howe Forbush, State Ornithologist of Massachusetts, has dedicated his life to the birds. It is peculiarly fitting that the people of that state, through their Legislature, should make possible the preservation of the results of this life work. They have done so in *Birds of Massachusetts and Other New England States*, the first volume of three having just come from the presses of the State Printer.

"The economic value of birds to the people of the Commonwealth," writes Dr. Arthur W. Gilbert, Commissioner of Agriculture, in a prefatory note, "has long been considered important. This commonwealth has recognized its importance by devoting a special division of the Department of Agriculture to the study of birds and their relation to the activities of its people. But Massachusetts citizens value birds, not merely for their usefulness in destroying insect pests or in bringing profits or affording sport—we also regard them highly for their esthetic value and the joy they bring into our lives. There is therefore every reason for the state to interest itself in their study and protection."

The first volume of Mr. Forbush's work deals in the main with shore and water birds. It is beautifully illustrated by full page plates in color from the brush of Louis Agassiz Fuertes and by many half-tone illustrations in the text itself.

Mr. Forbush cites the objects of the work to be "to interest the general public of Massachusetts and New England in birds and their national conservation; to provide our citizens with a means of identifying birds in the field or in the hand; and to furnish such other information regarding birds as the people desire and need. This first volume achieves these purposes and is a notable contribution to ornithological literature.

On to Florida

To those who haven't been but are going, those who have been and are going back and those who don't expect to go but will, Ralph Henry Barbour, the author, and Dodd, Mead and Company, New York publishers, offer information in *Let's Go to Florida*. In this volume, Mr. Barbour seeks to present in an impartial way Florida's merits and demerits. The book, the author emphasizes, is designed neither as a guide-book nor a gazetteer. It commences with a general discussion, touches upon the historical, proceeds to the natural history and geography and, naturally, the climate. The book takes up the boom state from its agricultural, industrial and recreational points of view, conducts the reader on sev-

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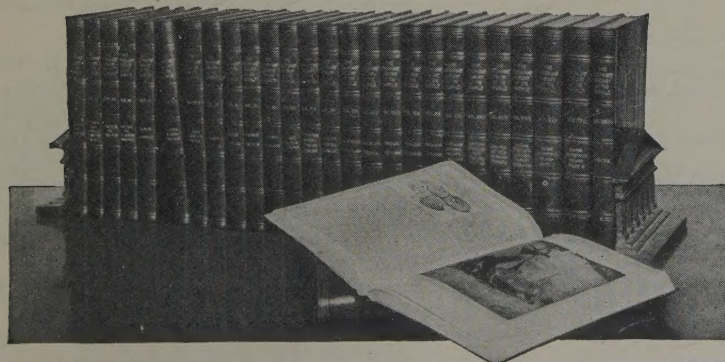
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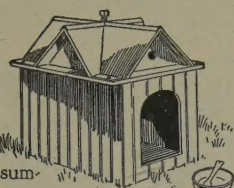
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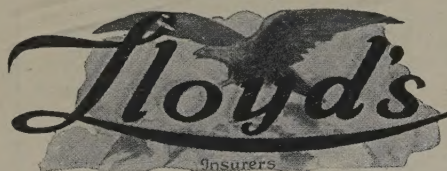
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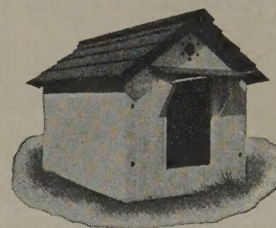
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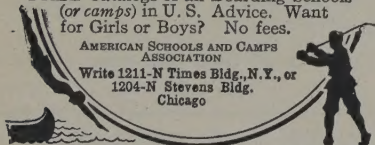
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SEMI-CENTENNIAL IDEA SPREADS OVER COUNTRY

Nation-Wide Response to American Tree Association's Forestry Call as Sounded in the Forestry Primer

IN 1876, the United States Government made the first step in forestry. To mark this semi-centennial year, the American Tree Association at Washington, D. C., has published the "Forestry Primer," and these will be distributed to teachers, civic organizations, and women's clubs and others. Every school is called on to mark the date. Planting of semi-centennial trees and their registration on the Association's Honor Roll at Washington will be one of the campaigns urged by the Association.

* * *

Requests for the Forestry Primer are being sent to the American Tree Association from every state. Hundreds of organizations, reports to the Association show, are making plans for forestry programs and for planting semi-centennial trees.

* * *

With 100 stops scheduled, the first semi-centennial forestry train, starting from the Michigan State College at East Lansing, is making a tour of the State of Michigan. In the Lower Peninsula the train is in charge of T. F. Marston, secretary of the East Michigan Development Bureau. In the Upper Peninsula the train is in charge of G. E. Bishop of the Upper Peninsula Development Bureau.

* * *

The train made a week's stand at the Michigan State College for the annual Farmers' Week, where the program was directed by Prof. L. F. Livingston. All the railroads in the state are cooperating in the operation of the semi-centennial train.

* * *

The train will be in the Upper Peninsula March 15 for nearly a month during which 52 stops will be made. There is an exhibit car, a motion picture lecture car and a car for those in charge of the train. In addition, there is a large enough staff of speakers who can jump out before the Rotary Clubs, Lions, Kiwanis Clubs, Women's Clubs, and all civic organizations.

* * *

Other agencies in Michigan have taken up the semi-centennial forestry program. Through Mrs. Edith C. Munger, president of the Michigan Audubon Society, the Forestry Primer is being sent to hundreds of members of that organization before it meets in April. Through Mrs. Frederick Raymond, of Grand Rapids, the Forestry Primer will be distributed at the annual meeting of the Parent-Teachers Association. "Your primer should be broadcast from shore to shore," says Mrs. Munger, "and it should be placed in the hands of teachers, preachers, club leaders, and organizations as a text for conservation and good citizenship."

* * *

In Tennessee R. S. Maddox, the State Forester, has started a State-wide plan of cooperation to which the people of the state are responding in a remarkable way. A letter was sent to civic organizations, women's clubs and Chambers of Com-

The Semi-Centennial of Forestry

The distribution of many thousands of Forestry Primers by the American Tree Association to schools, civic organizations and newspapers, has aroused every state in the Union and plans for cooperating in the celebration of the Semi-Centennial of Forestry are being furthered everywhere. Some of the activities are indicated on this page.

merce telling them about the semi-centennial plans of the American Tree Association. As in other states the teachers, too, are responding.

* * *

Out in Utah Prof. C. N. Jensen, State Superintendent of Public Instruction, has sent out a general letter to all school superintendents following a note from Gov. Dern. The way the schools have responded shows the great interest in the forestry question.

* * *

Forestry Primers were sent to libraries throughout the land and now hundreds of them are asking for additional copies.

* * *

Another state in the front rank in cooperating in this educational campaign is North Carolina where J. S. Holmes, the forester, sent a call to the state press announcing plans for marketing the semi-centennial.

* * *

William B. Greeley, head of the United States Forest Service, upon receiving a copy of the semi-centennial booklet, told Mr. Pack, "I am glad to receive a copy of the primer which impresses me as an admirable piece of popular education in this important subject."

* * *

"Celebration of the semi-centennial of forestry in 1926," says Gifford Pinchot, Governor of Pennsylvania, "is a fine suggestion, I am delighted to learn of the arrangements you are making for it."

* * *

Governor Billings, of Vermont, writes, "I am glad you are sending the Forestry Primer to each school superintendent and principal and I can assure you I am doing all I can to encourage this work."

* * *

New England, too, has jumped in the front in making plans to celebrate the semi-centennial of the first step in forestry. Thousands of the primers have been sent to teachers in New England.

* * *

Several meetings are scheduled for New England, at which the semi-centennial campaign will be discussed. William A. L. Bazeley, Commissioner of Conservation of Massachusetts, suggests the Forestry Primers be put before the conference of rural schools at the Amherst Agricultural College in March.

R. T. Titus, of the Vermont Forestry Association, is conducting a Forestry Essay Contest in the schools and is awarding publications of the American Tree Association as well as distributing the Forestry Primers to all members of his association.

* * *

Floyd M. Callward, Extension Forester in Vermont, is putting the semi-centennial before the Boys' Forestry Clubs in the state.

* * *

In Massachusetts, H. O. Cook, Chief Forester, who is Merit Badge Examiner in Forestry and Conservation of the Boy Scouts for the Greater Boston area, is putting the primer and the semi-centennial idea before that organization of potential woodsmen.

* * *

In Rhode Island, a big campaign of education on tree planting being conducted by Walter E. Ranger, Commissioner of Education, will incorporate parts of the Forestry Primer and the semi-centennial.

* * *

Through the cooperation of C. R. Pettis, of the Conservation Commission of New York, thousands of primers are being sent into that state to fish and game clubs and fire wardens. Through the New York State College of Forestry at Syracuse a big distribution of the Forestry Primer is being made and Arthur H. Graves, of the Brooklyn Botanic Garden, has worked out a plan for getting the primer into the Nature Study Classes of the city schools. One of the first calls from New York State for primers came from Mrs. Leon Janivet, of the Conservation Department of the Woman's Club of Albany. Other calls have come from the Madalin Schools and the Brewster Public Schools.

* * *

Pennsylvania has received its quota of Forestry Primers. They have also been sent to officials of the State Federation of Pennsylvania Women, to Pennsylvania school teachers and to libraries.

* * *

The Association has written Mrs. John B. Hamme, of York, Pa., the state president, outlining plans for marking the semi-centennial. One of the first Forestry Primers sent into the state went to Mrs. Harry Shoemaker, of Philadelphia, who, through the Conservation Department, will take up the semi-centennial idea in that city.

* * *

Plan now to mark 1926 the Semi-centennial of forestry by planting trees and registering them on the National Honor Roll of the American Tree Association. Tree-planting suggestions, a tree-day program and registration blank will be sent your schools, Scout troops or other organizations for a stamp for postage.

American Nature Association

ORGANIZED TO STIMULATE PUBLIC INTEREST IN EVERY PHASE OF NATURE AND THE OUT-OF-DOORS, AND DEVOTED TO THE PRACTICAL CONSERVATION OF THE GREAT NATURAL RESOURCES OF AMERICA

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

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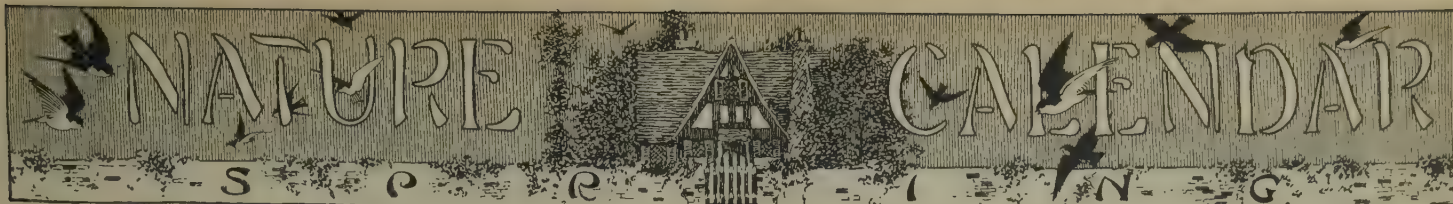
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MARCH

Maple sugar camps are busy now and sugaring-off parties are numerous.

The conspicuous legs of the young lambs help explain the fact that when two days old the little creatures are able to follow the flocks.

Three meteoric showers are due to occur in the northern sky this month; a slow bright shower near Polaris about March 18, a swift one near the bowl of the Big Dipper about March 24, and a slow shower near the head of Draco about March 28.

The blossoms of the silver maple will open this month, it being the first tree to flower in the spring. Two weeks later we may expect to see the elm in blossom, also the red maple which "crimsons to a coral reef."

Hepatica and spring beauties are peeping up through the leaves in southern woods. Learn to love them in the woods where they belong. Leave them there to find another year.

Spica is a large white star in Virgo just rising in the east. It is said to represent an ear of corn held in the Virgin's left hand.

Mating is prevalent in March. Wolverines, fishers, minks, weasels, otters, red foxes, lynxes and chipmunks are courting. The young skunks are believed to select their life mates at this time.

The peepers singing in the marshes are noted "musical messengers of the spring." Try and distinguish the pure unbroken tone of the pickering from its rival the mottle-legged "cricket" with its "shrill rattling pipe."

The winged seeds of last year's maple are standing on their heads. They are held in this position by the baby root just beginning its journey into the soil.

Pine cones are busy clicking. The click of the Austrian pine may be heard for about two hundred feet. The clicking of the cones heard on a warm day beneath a Scotch pine is said to resemble bedlam. This sound indicates the opening of the cone and the freeing of the seeds.

Miracle

"Yesterday the twig was brown and bare;
Today the glint of green is there
Tomorrow will be leaflets spare;
I know no thing so wondrous fair
No miracle so strangely rare.
I wonder what will next be there!"

—L. H. BAILEY.

The spice bush shows its greenish-yellow flowers before its leaves come out.

The restless antics of pine cones, gathered on a winter day and left for some time on the mantel, will furnish much entertainment.

Arcturus, the yellow star in the left knee of the herdsman Bootes, now shines in the eastern sky. It is a thousand times the size of our sun and is traveling through space at the rate of ninety miles a second. Its light takes forty years to reach us.

There is a noticeable increase over February in the number of birds migrating from the south. The cowbirds, meadowlarks, phoebes, field, vesper and swamp sparrows are all this month's addition to the group.

Near the tail end of Leo in the southeastern sky there occurs a slow bright meteoric shower about March 14. Near the variable star in Perseus in the northwestern sky another very slow shower will occur about March 1.

Bees are harvesting from the skunk cabbage blossoms and from the oozing sap in fresh wood piles.

Over most of our country the ducks and geese, seeking again their accustomed nesting grounds, are pushing northward, following closely the retreating ice as it once more exposes their sprouting food in the ooze of marsh and swamp.

Though everywhere the official month of spring, March bears a various message to our people. In New England it brings the bluebird, who, as Burroughs truly said, bears on its back the color of the sky, and of the earth upon its breast. Farther south this welcome herald has come earlier, or perhaps has remained all winter.

In the far north this month marks the time when the powdery snow, prevented by the continuous cold from crusting, first begins to melt at noonday under the rays of the mounting sun, and nightly freezes into a crust that helps to bear up the snowshoe runner.



TRY AND TRACE THE ANCESTRY OF THESE FELLOWS

We'll let you in on the secret. They are "Snookum Bears," but don't go hunting in any natural history because the name was invented by some dealer who had coats mundis for sale. Their scientific name is *Nasua narica*.

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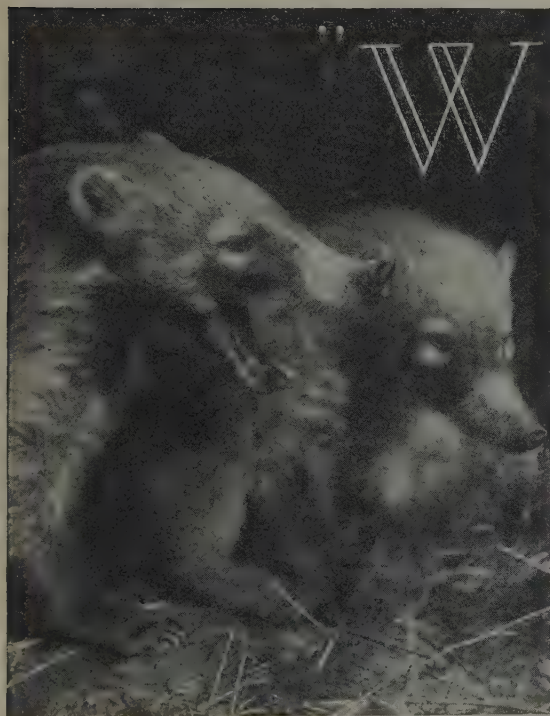
In contemplating the spectacle of Nature we find everywhere order and harmony, a beauty that enlarges our affections and calls forth virtue within us by destroying egoism.—
EDOUARD ANDRE.

SNOOKUM BEARS—COATI MUNDIS

By IRENE FINLEY

(PHOTOGRAPHS BY WILLIAM L. FINLEY)

Coati Mundi may not sound like an animal of intelligence, yet one of these little fellows in captivity showed a good deal of ingenuity in solving a problem that was put up to him. He was tied and had only a limited space to move about. A tobacco box was lying just out of reach. After stretching himself as far as possible, he could not reach the box with his front paws. Then he turned around with his back to the box, but couldn't reach it with his hind foot. Suddenly he discovered that his tail might be useful. It reached out close to the curious object. Crooking the end of his tail, he drew the box within reach and satisfied his burning curiosity.



JUST A YAWN

But it gives one a good look at the funny rubbery noses of coati mundi.

ELL, what in the name of goodness are they?" asked a friend who stood gaping at our "snookum bears." He was looking at two little animals huddled in a corner of a large cage with their arms around each other, casting sheepish, timid glances from faces streaked in a clownish manner with orange and brown. They were about the size of raccoons with long, faintly ringed tails, coarse hoary-tipped hair above, running into reddish-brown underneath, black feet with bear-like claws, short round ears, and most confusing of all, long, flexible noses that curved up or down so



ANOTHER YAWN

The nose is a pliable instrument and can be curved upward or downward to catch a scent.



PANTING LIKE A DOG ON A HOT DAY

This view of the "Snookum Bear" suggests some pig ancestry. Although not closely related to any other animal, this curious fellow is perhaps nearest to the raccoon.

that they might catch any strange scent on the air. "It's easier to tell what they are not," I replied. "Snookum bears are not catalogued in any book I can find, so this pair is traveling under a trade name. All I know is, anyone who tries to trace their ancestry will run into some problems."

Just then a sudden noise frightened the freaks. One dashed excitedly about with his long tail sticking up like a balance pole. A monkey! And that tail looked as if it almost had the ability to reach out, feel and hook on to things. Why not? The other scampered up a fir tree. Halfway up he was perfectly at home and played around on the branches, but when he got out where the limbs were slender and wobbly, he lost his footing. He went up easily, but he came down hard. Only luck saved him. He fell in a most unscientific manner, back first, and by the merest chance came to port squarely on the top of a woven wire fence that catapulted him into the air and plumped him on the ground eight feet away. He must have been as tough as a hickory nut, for even his feelings were not ruffled. Indeed, he straightway climbed another tree as if the fall was just a part of the game and he wanted to try it again. This time he took more time coming down, head first and hanging on with the claws of his hind feet very much like

a red squirrel. He might be part monkey, but still the clue was not clear.

All at once the big male reached back and began to scratch with both paws hand over hand with a combing movement. The scratching didn't seem to satisfy him, so he turned up his nose at an angle where he could bring his under-slung mouth into play for a good simian nibble on the hip.

"Now monkeys are not carnivorous," interposed the friend. "What do these fellows eat? Let's try them on a chunk of meat." So a piece of beef was put down in front of them. The result was immediate. The little female lifted her prying proboscis and sniffed the air. Then she reached eagerly for the meat. But why should she think of touching that fragrant morsel before her better-half tried it? With a pig-like poke of the nose he shoved her back into the corner while he glowered over the meat till he should feel ready to eat what he wanted of it. But the lady in the case had a mind of her own frequently, and then there was a real combat of noses with much squeaking and grunting, until she retired to her corner. Later on we adopted the custom of separating their food into two portions at some distance apart. Even then, however, her piggish partner shuffled back and forth to her dish and carried off the most prized bits of food. Then he would squat bear-like on his haunches, picking up hunks of

it in his paws and shoving one bite after another into his mouth with the propensity of a real porker.

There were many puzzling things about these little animals and it was evident our acquaintance was too new to throw much light on the subject. When it came to queer antics, they likely had many we had not seen. One day I sat near Snook in the grass. He dug up the roots with his long claws, chewed them a moment and then, with his pig snout, kneaded the pulp into his tail till it had been treated as one washes a garment with soap.

"Get a little rope, and let's take one of them out in the

"Well, that helped us a lot," said the friend. "Let's try again. We'll put a collar on him this time."

We handled him quietly and Snook was quite docile and trustful by this time. He was not a nervous animal and he could see that our intentions meant him no evil, so he allowed us to fasten a little dog collar around his neck. This was much better and he was going to take a peaceable walk on his leash. I took my hands away from the collar. Snook gave me one comical look from his sheepish eyes, put both hands behind his neck and slipped that collar over his head as if it had been greased by Houdini and was no trick at all



REGISTERING THE MOST CAREFUL ATTENTION

In Mexico they call them raccoons but they have claws like a badger or bear for digging in the earth, a long nose for rooting and a tail like a monkey.

open and get a picture of him," came from one of the spectators. A noose was made, ready to tie on one of Snook's hind legs above the first joint. I approached tactfully and with reassuring words. He sat quietly in his corner with an innocent expression on his wide open face. I reached out my hand to pet him, but drew it back. There was a chopping sound of jaws and a clicking together of sharp teeth, but his face was placid as ever.

"I guess I had better put on gloves," I remarked. Even so, before I got the tether on a hind leg, the gentle snookum bear had snapped at me and pinched hard through the leather. And he did more. He reached back with that handy nose and pulled the rope off his heel as if he was used to it. Then we took notice of something that had escaped us. His legs were formed so that they sloped evenly down to his slender feet, joints included. Goodness, what a queer beast!

for him. We sat back and laughed till our sides ached. The joke was on us.

The secret of handling the snookum bear was revealed to us a few days later. It was not with ropes or collars. He didn't need them. One day when I went in to feed the bears, the little female became excited over something and scurried around the big cage. Before I could prevent it, she squeezed through the door which someone had left unlatched. Up a tree she went like a monkey from one branch to another through the woods, as freedom lent wings to her frenzy. We followed, but could not keep up, and she was soon lost to us. The big snookum in the cage paced up and down and climbed the wire restlessly for most of the first day. Then he settled down in a corner and watched. I took occasion to stay in the cage more than usual and sit quietly and talk to him or feed him something that he liked. Soon I noticed

that he watched for me instead of for his wandering mate. Gradually I began to pet him and put my hands on him. Never once did he snap at me or touch my hand with his teeth. I rubbed his neck or back without fear, and the only objection he ever showed was to push me away with his paw. But it was evident that he liked to have me there, and when I stayed with him he ran around me and sat down close and ate out of my hand. He was very fond of bananas, and I saw to it that he had a plenty of them. I would take a banana in my hand and hold it so that he could get only small bites at a time. He would sit up and hold my hand in his paw and then dig out the soft banana with the claws of the other paw and stuff it into his mouth.

Soon it became no trick at all to handle him and get him to do almost anything we wanted him to in taking pictures. Because he was lonesome for his lost mate, he had accepted us for his companions. So often is this the case with a wild animal. One alone can be quieted and made friendly, where two or more are sufficient to themselves and do not respond to human friendship or handling.

Thus we enjoyed a respite in peaceful friendship with these most unique of pets. But what of the little female that had run away? These strange woods with giant firs and cedars must have seemed far different from her jungle-like forests of southern climes. Also she was lonely, far lonelier than her mate that found consolation in the company of human beings and a banana. Several times we saw her stealing down a fir tree over the cage, where a dinner had been left out for her and not elsewhere to be found. Perhaps, too, at night she came and nuzzled her rubbery nose against her mate's through the wiry meshes. At any rate, on the third day she had learned, as humans sometimes have to learn, too, that personal freedom is too dearly bought at the price of misery. We found her near the door, opened it and a moment later Snook and his wife were snuggled close together in reconciliation and reunion. The only trouble was that we humans lost out in the attempt permanently to win another animal friendship.

"Let's find out where these animals came from and who has met them at home," I said. It happened that E. W. Nelson, Chief of the United States Biological Survey, had hobnobbed with them when he was down in Mexico. There are two species, the Mexican and the South American. Occasionally one of these Mexican coatis crosses the border into the United States. These little animals hunt in bands and it is self-evident that several families run together. In a single band, animals of all sizes are found, from full grown down to the very young ones.

Mr. Nelson gives a brief picture of them in their own

haunts. "I was in the forest one day when I heard something jump to the ground and run off into the leaves. I stooped to look in the underbrush and saw a small animal running away with its tail high in the air. A moment later another one scrambled down from the tree and made off in another direction; and soon they were raining down from all the nearby trees. They had been feeding on wild figs and other fruit, and when one of them was scared all the others in the band immediately jumped and took to cover. They are good climbers and are equally expert in running swiftly through the jungle."

They are, indeed, fond of fruit. We offered them every morning a number of apples for breakfast as well as a banana each and any other odd fruit that was left from our table. Old Snook would take a whole apple in his paws, sit up and eat it with great gusto. Then he would start in on his real meal which consisted of some chopped-up fresh meat, cooked vegetables and bread with sugar or syrup on it, or a bowl of bread and milk. In the season of small fruits I remember how pleased both Snooks were to have little French prunes brought in for them. These prunes are as sweet as honey when dead ripe. Snook would push one after another into his mouth with the seeds and juice dropping down in front of him. It was fun to feed the Snooks. They enjoyed their meals so much. They were not finicky, but always shoved their long noses about in the food to see just which thing they wanted to begin on, and they always began on the best first, which was something sweet. You should have seen custard pie go down. What a smacking and licking of gooey paws! Then they licked each other's faces to get the last taste. My, but they were busy at it!

Now where could the pie propensity have come from in a Mexican forest? Down there this little animal is called Coati Mundi. A coati is an American plantigrade carnivorous quadruped. This is as confusing as the looks of the animal itself. His scientific name is *Nasua narica*, which is appropriate because it has something to do with his long, rubbery nose. But you don't catch a Mexican calling him any of these names. He is simply a Tejon, or raccoon.

We had surmised all along that Snook's family tree was connected with that of the raccoon. The raccoon has a long tail, a brush instead of a club like the snookum bear's. The raccoon's face isn't orange and brown, and his nose isn't made of rubber, but you can't be too particular when you are hunting for ancestors. Perhaps you have heard of that tracer of your family tree called the Mendelian Law which finds out that your children may look like you, or they may look like your neighbor, especially in the third or fourth generation. Socially, this is bad, but it's all right for coons.



In this article Mary Francis Baker tells us about the wild flowers that grow on the much-advertised Florida real estate. Mrs. Baker, incidentally, is author of a book just off the Macmillan press on the wild flowers of Florida, a volume which apparently fills a need hitherto not fully satisfied.



GRAPE AND SMILAX BORDER
THE LAKES

With its abundance and variety of wild flowers, the Florida peninsula makes the most enjoyable year-around botanizing ground in this country.

FLORIDA WILD FLOWERS

By MARY FRANCIS BAKER

TO THE botanist each new field is a new adventure. Only the finder of dinosaur eggs, the archaeologist searching for a buried city, or the explorer in a new country can know that thrill of mingled hope, delight, and uncertainty with which the flower-hunter enters unfamiliar paths.

When his journeyings lead to Florida he finds in the wild flowers certain old acquaintances of colder climates; others related to those he has known, yet of quite different appearance; and a large number of plants that are entirely new to him. The abundance and variety of Florida wild flowers, the fact that in the southern part of the state they are in bloom throughout the year, and the extraordinary characteristics of many of them, make the Florida peninsula the most enjoyable year-around botanizing ground in this country.

The great magnolia, with fragrant white flowers eight inches across; epiphytes growing in large colonies on the trunks and branches of trees; moonflowers and crinum; strange mangrove and gumbo-limbo trees; and an unusual number of those small brigands and highwaymen, the insectivorous plants, are but a fraction of Florida's remarkably interesting flora.

Air plants, from whose spreading leaves handsome green and gold tree-frogs look out on the world, cling to the trees and open their flowers far above the earth. That singular flowering plant, the Spanish moss, with little lily-like flowers fragrant at night, drapes and decorates the trees with its

abundant growth. Ferns up-holster the branches of huge live oaks, and grow in the bases of the leaf-stalks and on the trunks of tall palms. In extreme southern Florida the strangling fig, relative of the noted banyan and rubber trees, shows the forceful life of the tropics. After an uncertain adolescence, perched, perhaps,

high on some tree where the seed has been left by a bird, it becomes in time a forest tree, standing in the place of its host, which it has literally strangled by its relentlessly increasing growth.

The attractive spoonflower (*Peltandra sagittaeifolia*), resembling the larger white calla to which it is related, blossoms by streams and ripens globular clusters of bright red berries. Above dry marsh grasses in late winter rise what, from a little distance, seem to be white lilies on tall stems, yet prove to be not flowers at all, but white bracts, tipped with green, that surround the small blossoming spikelets of a sedge. Pipeworts of several species, whose tiny blossoms are more like fringed bracts than like flowers, grow by myriads in marshes and low pinelands. Their leafless stalks, which rise from basal rosettes of narrow leaves, are capped with flowering-heads appropriately known as "buttons" and "everlastings." The pipeworts oddly resemble the great composite family by crowding their little flowers tightly together in heads above a covering of bracts.

Yet here, too, many plants of northern range are seen. The partridge berry (*Mitchella repens*) is at home in

Florida woodlands. White Indian pipes (*Monotropa uniflora*) are occasionally found; sumacs, wild cherries, and willows are common, and the button-bush (*Cephalanthus occidentalis*), from whose flowering-heads the styles stick out like pins in all directions, grows as often in Florida as in the north. Here, however, some memory of the early explorers is shown in its local name of Spanish pin-cushion.

The great diversity of soils in Florida gives rise to many different plant associations, and makes it possible to pass, during even a short walk, from lake shores curtained with grape and smilax, past marshes of varied flowers, by swamps of the beautiful sweet bay (*Magnolia glauca*), filling the air with delicious fragrance, to pinelands where papaws open large showy blossoms. There, too, a handsome relative of rhododendrons and azaleas, the *Befaria racemosa*, blooms in a profu-



THE CROW-POISON DESERVES A BETTER NAME

It is one of the many startling and beautiful wild flowers that one finds on a tramp in Florida.

sion of seven-petaled white flowers, delicately tinged with pink at the center, and nearly two inches across.

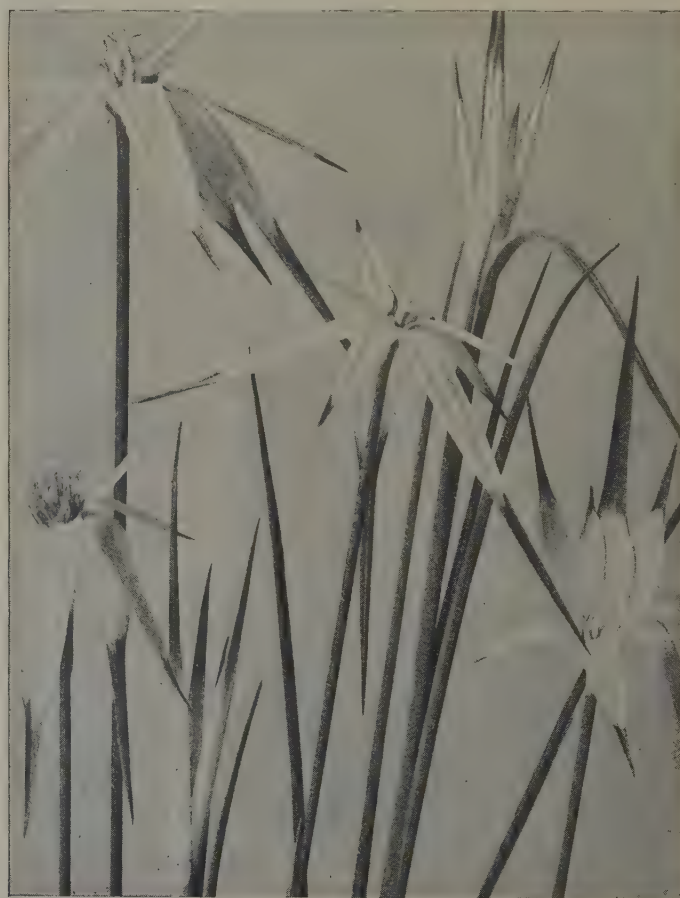
In dry soil miniature bushes of knotweed, white, pink, and rose with their many little flowers, are abundant. Handsome southern lupines, growing in spreading groups of many stems, differ widely from their northern cousins by having undivided leaves which are conspicuously silvery with silky hairs, while their seed-pods are densely woolly.

Hammocks and swamps are often bordered with wild hibiscus, blossoming in red, pink or purple. The beautiful climbing aster (*Aster carolinianus*) pushes long stems up through the undergrowth and lies nearly all winter in flowery wreaths along the branches of trees and shrubs. Other remarkable southern asters, found in pinelands in autumn, are *A. adnatus*, whose little upright leaves are attached to the stem through part of their length, and *A.*



SEA STARS OR MARSH PINKS

The marshes are often found beautiful with the rose-colored stars of this plant after the yellow milkworts are gone.



THE LILY-LIKE WHITE-TOP SEDGE

It is also almost as beautiful as lilies, and lends its charm to the botanist seeking a thrill.

squarrosus, whose tiny leaves are sharply reflexed. The attractive violet-rayed flowering-heads of both species are much alike, and the question as to why their leaves should show such wide divergence may be numbered among the many perplexing problems which Darwin called the "abominable mysteries" of the plant world.

To walk by pineland and marsh in the Florida peninsula, under the warm, bright sky of a winter day, finding violets, butterworts, lupines, and many other flowers, is a pleasure that one is inclined to repeat as often as possible. Well-known plants of northern fields, others so closely resembling them that their botanical relationship is quickly guessed and easily verified, and still other flowers of unfamiliar appearance lead the Nature-lover on from moment to moment, mile after mile, in that excited delight the botanist knows so well, but can seldom communicate to others.

Following a path between marsh and pineland, one finds, even in midwinter if frost has not brought a brief halt to the abundant life, flower after flower to claim interest and admiration. Handsome evergreen shrubs of *Vaccinium nitidum* and *V. myrsinites*, only a foot or two in height, with many little shining leaves and many little white and red flowers, are as common in pine-lands as are the clusters of green palm-leaf fans that the saw-palmetto spreads. A dew-flower (*Commelina angustifolia*) whose blue blossoms seem always to have lost a petal, since one of the three is so small that it makes no display at all, is seen in many places. And flowery mats of the round-leaved houstonia, close relative of the bluets of northern meadows, lie on the sandy soil with their small white diamond-shaped flowers.

Borders of pinelands are dotted with bright yellow "thimbles" of a Florida milkwort (*Polygala rugelii*), which crowds its flowers in compact heads at the ends of the branches. The smaller *P. lutea*, with oblong, orange-colored thimbles, ventures into the marsh, where sundews (*Drosera*) spread rosettes of glistening reddish leaves as snares for minute insects, and the delicate bluethread (*Burmattia biflora*) hides under the grasses.

In this borderland between marsh and pineland the attractive crow-poison (*Tracyanthus angustifolius*) sends up in spring pointed racemes of white flowers which change to



A FLORIDA RELATIVE OF RHODODENDRONS

This wild flower is called Tar-flower because the buds are sticky as many an insect has learned.

pink in withering. Orchids—bright limodorums of several species, and fragrant pogonias—blossom here in profusion during late winter and spring. Later another orchid, *Habenaria nivea*, that whitest of flowers, fills the marsh which earlier was yellow with milkworts (*Polygala cymosa* and *P. ramosa*), and later will be ornamented with rose-colored stars of the beautiful *Sabbatia grandiflora*. Butterworts, whose attractive flowers sway on leafless stalks above basal rosettes of pale green insect-catching leaves, blossom from February to May—*Pinguicula lutea* with large yellow flowers, the purple *P. elatior*, and the little *P. pumila* with flowers that vary from lavender to white. The leaves of butterworts are no less interesting than their flowers, for they are covered with a colorless secretion that securely glues down any small insect that touches it. When the victim is caught a secretion of different quality is poured out which dissolves the soluble parts of the insect's body, and enables the plant to feed on

its prey by a method astonishingly like that through which we derive nourishment from food.

In low pinelands is found the most interesting of all the common insectivorous plants of the Florida peninsula, the spotted trumpet-leaf (*Sarracenia minor*). Although of the same genus as the northern pitcher-plant it is not only more attractive than that species but is also more remarkable in its habits. In late winter the clusters of long, trumpet-shaped leaves appear, pale green, variegated with pink and purple, and in spring the long-stemmed yellow flowers open.

From January onward, during an ordinary season, the profusion of flowers continually increases. Prairies are colored with white and yellow flowers in spring, and with blue and purple in autumn. And even on the beaches, morning glories, sunflowers, wild beans, evening primroses, and other plants thrive, seeming to prefer a precarious existence by the sea to greater security inland.

The pleasure of flower-hunting in the Florida peninsula increases with one's knowledge of the wealth of the Florida flora. Tropical keys and shores, marshes and dry hills, cypress swamps and hammocks, prairies and pinelands offer a changing succession of flowers, in Nature's infinite variety, as a perpetual invitation to further search.

In an early issue of NATURE MAGAZINE, Mr. Shephard-Walwyn will treat us to the second article in the series on the Harmonies of Nature, discussing the factor of sound in Nature's world. In expanded form and in combination with other Nature material, these articles will appear in book form later this year.

Volcanoes of Foam

By W. W. CHRISTMAN

THE BOZENKILL is a small stream that pours down between the foothills of the Helderbergs in Eastern New York. This section is wild, hilly and unprofitable for farming. The hills were long ago stripped of their original hemlock and turned into wild pasture. The stream, in the wilder part of its course, roars down between steep, shaded banks when the spring freshet is on, falling nearly two hundred feet in a mile in a succession of cascades and cataracts. But it is of this stream in February, sealed in ice and buried in snow, that I wish to speak.

Under certain weather conditions, usually in February or very early March, one may often see the building of volcanic peaks in replica at the foot of many of the cascades—volcanoes of creamy, frozen foam. They are a rare and beautiful spectacle. During a winter thaw the pulse of the stream which has been for a long time throbbing under a thick coat of ice, is suddenly quickened by a hundred invisible rivulets that find their way down through the hill meadows and wild pastures. Even before the thaw one can hear the muffled tinkling of the water as it slips over the ledges and hurries on from pool to pool. Then the activity is increased until the stream finds vent at the foot of some little fall where the ice is thinnest and where the observer may witness a real volcano, or sometimes a group of them in eruption.

The accumulated foam is tossed through this vent until a low mound is formed, frozen of course, for the cold wave that follows the thaw must assist at the building. Though the temperature falls, the mound continues to increase until just over the vent a hollow cone slowly rises, due to the agitation and pressure below. The live foam is constantly forced to the top where it spills over and freezes until a wonderful volcanic peak in miniature results, often five or six feet high, and more beautiful and symmetrical than the old pictures of south-polar volcanoes in the school geographies of our youth. To add to the similitude these volcanoes become extinct after a time, the internal action subsides or ceases, the final jet of foam is frozen, the peak is sealed at the top, and the geological likeness is complete.

The tube or pipe leading up through the cone is found to be worn perfectly round and smooth, but the outer surface is so fragile that it is difficult to describe. Most if not all of the wonderful and perfect forms existing in frost and snow crystals live on the outer surface. It resembles a pyramid of the lightest and creamiest lace, folded and looped and crumpled by a weight so insignificant that I have sometimes wondered whether a cone as tall as a man would weigh more than a few ounces.

The wall of the cone is so thin and



PYRAMID OF FOAM

It is as though made of the lightest and creamiest of lace, folded, looped and crumpled.

frail that the building can go on only in still weather or in sheltered places, which makes the phenomenon still rarer. It is usually on a perfectly still morning after a brief thaw that the finest specimens are found. Sometimes several years pass before weather conditions are suitable for the building of a tall and perfect cone, and many years before the observer is fortunate enough to find one in the making. But here, too, my good luck has held, for I have seen a cone in eruption when little shreds of foam were ejected and instantly caught up and blown away like feathers by a wind so gentle that I was not previously aware of its existence.

About forty years have passed since my first discovery. The first cones photographed were in February, 1911. A number of years passed, when in March, 1919, we were able to secure the unusual group shown in the photograph. From that time until February 16, 1925, I had not seen one worth kodaking. Then we discovered the solitary one within a stone's throw of our home. This cone is not so slender and graceful as those in the group of 1919, but as the temperature remained nearly stationary for several days, it reappeared on the two following mornings nearly as perfect as when the photograph was taken. I have never seen one that stood more than three or four hours after sunrise.



EPHEMERAL MOUNTAINS

The finest specimens are found on perfectly still mornings after a brief thaw.

OUR FRIENDS THE SPIDERS

By Paul Griswold Howes

TO ALL APPEARANCES THE LAST WORD IN FEROCITY

As a matter of fact this is merely a picture of one of our common spiders greatly magnified. Note the six eyes of various sizes and the apparent ferocity.

THERE are two facts that the uninitiated should know about spiders at the outset. One is that they are not insects. The other is that the vast majority of them are not only harmless, but helpers of mankind in every sense of the word, destroying large numbers of insects, many of which are distinctly harmful.

Spiders belong to the Arachnids and are nearer to the lobsters, shrimps and crabs than they are to insects, although they are almost universally called insects. An easy method of separating them from this class is by their legs. Spiders possess eight legs, whereas insects have but six.

The spiders are nearly all harmless or nearly so. They do everything in their

The dread tarantula is not nearly as dreadful as he is advertised to be, Paul Griswold Howes tells us in this fascinating story of some of the spiders. He has met this fellow in his own haunts—the jungle—where Mr. Howes is much at home himself having carried on extended studies in those outposts of the world usually called "impenetrable."

power to avoid contact with man in an aggressive manner. They come about our homes for the flies and other insects that are also attracted there, and it is in this manner that they are continually working for our benefit. Even the dreaded tarantula of South America is among the spiders that are beneficial and I have seen them in camps remaining hidden during the day and venturing forth by night to prey upon the gigantic roaches that

infest the houses. They grow to an enormous size, but the people in these countries do not often kill them because of their predatory habits and peaceful nature. In British Guiana I have lived in a shack containing a dozen or more tarantulas which never



A TWO MONTHS' HAUL

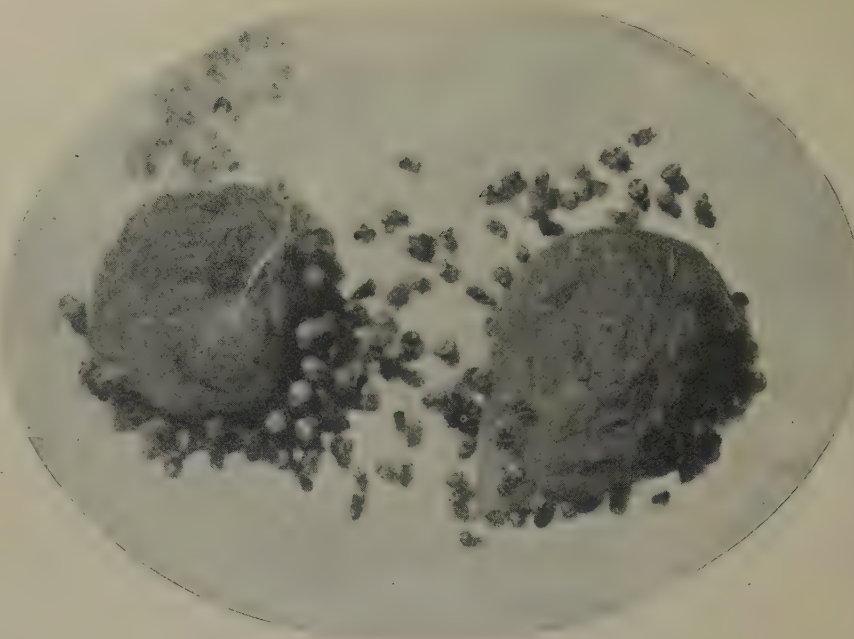
A pile of ninety-eight ground-up insects caught in this spider's web in the course of two months. He proudly surveys the catch.

disturbed me as long as I treated them in a like manner.

The bite of the tarantula, as far as its deadly quality is concerned, is greatly overestimated. In some few cases where the person has been weak, or in a run down and non-resistant condition, it is possible that death may have occurred from it. In the cases that I have seen and have suffered personally, it resulted in nothing more than a swollen member, accompanied by some pain and fever, which passed off rapidly, leaving no ill effects.

One of the most interesting and ingenious of the spiders is the trap-door species, occurring in the southern and southwestern states. It is a hairy, black species of powerful build that constructs a burrow for its nest. This burrow is in clay and consists of a deep tube, beautifully lined with silk and into the top of which a perfectly fitted hinged door is set. So neatly is it adjusted that when shut, no joint or crack may be detected from the outside. When frightened, the spider runs into its tube, closing the door behind it, where it remains in perfect safety until the danger is over. In some cases a side tube is also constructed with a door as neatly fitted as the first. Truly this spider is a master workman.

Of our common spiders, the Lycosids are of great interest. They live on the ground and make no permanent web, running about from place to place and using any convenient hiding place for the time being. The egg case is carried about by the female and when the young emerge they ride about upon their mother's back wherever she goes, until they are fairly well grown. It is a common sight to see them thus in September. As the mother progresses, the youngsters may be seen moving about,



THE BIG PARADE

Baby house spiders marching out of their egg cocoons after their homes had been moved into the light for the camera.

like tourists on the deck of a steamer!

Other species are remarkably camouflaged. Through countless years the process of natural selection has been shaping some species until they resemble entirely different objects, that are perhaps not edible to spider enemies. One species is like the excreta of a bird, while others have developed so many long spines as to appear more like some vegetable bur than a spider.

A minute but formidable enemy of spiders are the Ichneumon flies, and

there are many species that attack spiders. These little creatures belong to the Hymenoptera, the same order to which ants, bees, wasps and saw flies belong, and are therefore not flies at all. Ichneumons attack the egg cases of spiders, depositing their own minute eggs among those of their hosts. When the young "flies" hatch out, they feed upon the eggs of the spider, thus destroying the entire brood.

We often find a second species of Ichneumon depositing eggs upon those of the first parasite, so that the plans of the first destroyer are often destroyed themselves. This is termed hyperparasitism, and is one of the most interesting things in Nature.

Wasps are other enemies of spiders. These insects hunt and capture countless numbers of them, using them as provender for their young to feed upon. Some of the solitary wasps that build the well-known mud nests, often pack these clay cells with thirty or more spiders of several different species. In a nest containing twenty cells, a huge number of paralyzed spiders may be found with the maggot-like young of the wasp feeding upon them.

Spider's eggs are very small as a rule



THE LATCHSTRING IS OUT

The door of the trap-door spider's home is open. At the right is the architect himself. Note the door-sill on which the flap rests.



OUT FOR A FAMILY AIRING

Here is a Lycosid spider carrying an entire brood of young on her back. This is a common sight but a very rare photograph. The youngsters amble about on mother's back like passengers on a steamer's deck.

and are usually deposited in fairly large numbers, as mortality among the young is very high. Some are placed beneath silken coverlets upon stones or boards or behind loose bark. The majority are deposited in clusters and afterwards covered by a tough silken ball, or other more ornamental contrivance. One species makes an egg-cocoon resembling a withered fruit pod, while a certain South American species suspends its cone-shaped egg case upon a long thread, and covers its surface with spines made from silk.

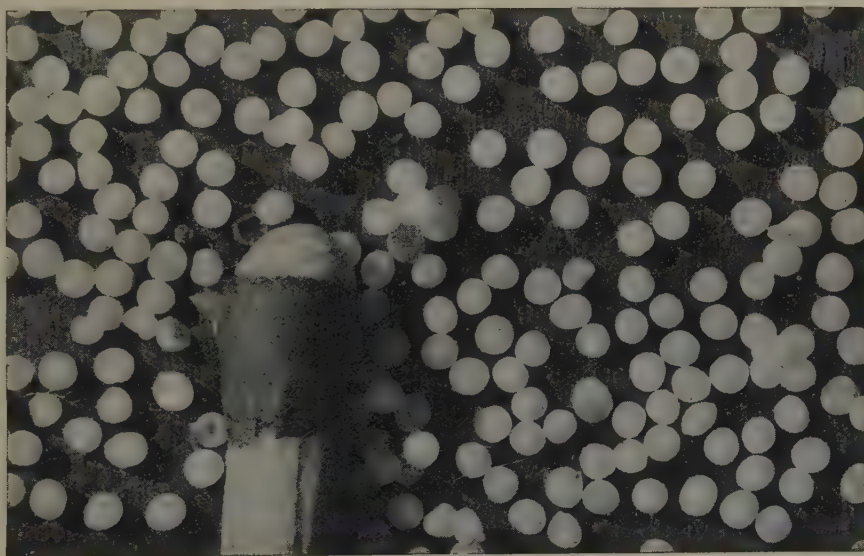
Young spiders shift for themselves when far from maturity, many when first born. Within the egg-cocoons the young appear in early spring and at various other times during the year, according to the species. Those which hatch out very early often remain within the cocoons for a considerable period, feed-

ing upon the weaker ones that are imprisoned with them.

In the fall, many full-grown and partly-grown spiders construct heavy silken houses in protected situations under stones, or loose bark or in buildings where they remain in a sluggish condition until spring.

Little need be said of the wonderful webs of spiders, for

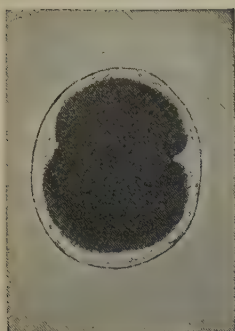
they have been described and photographed so many times before. It is interesting, however, that many spiders renew the cross threads of their webs at night, leaving only the radii in place. This keeps the web in repair and the work is done when most spider enemies are asleep. They may be seen working at night in almost any vine or porch corner, where their building procedure may be studied to advantage by means of an electric flash light.



SPIDERS IN THE EGG

These eggs have been removed from the cocoon and are photographed about five times life size. The match head shows comparative size.

"I certainly am happy to be getting NATURE MAGAZINE again! Up at school the boys come around and borrow each copy, when I have finished with it. I have really learned a great deal from it in the past year. The big pictures that come every month are worth framing, and I have saved them all."—Excerpt from a "thank you" note from nephew to aunt in appreciation of a gift of NATURE MAGAZINE.



INTO TWO

The tiny one-celled plant grows by cell division.

Red Snow

By JOHN J. SCHOONHOVEN

(PHOTOGRAPHS BY THE AUTHOR)

"WHITE as the driven snow," a glistening landscape under its winter mantle of brilliant crystals, this is the familiar mental picture. "Red snow" seems a contradiction in terms. No stranger tale, therefore, told by explorers of the frozen north, taxes the credulity of

"red snow." It is not strange that so striking a phenomenon as the apparent fall of bloody snow from the heavens should have stirred mystery-loving, superstitious people with awe and fear.

The explanation of this startling appearance of strange color on the white expanse of the snow is comparatively simple. When subjected to the tests of science and the searching magnification of the microscopic lens, this apparently miraculous happening is found to be far from a supernatural visitation or a dread portent. It is merely a small plant flourishing on the moist cold surface of the snow and flaunting its bright color quite as innocently as does the columbine, nodding its crimson corolla on the sun-drenched hillside in the New England spring.

the lay public more than the description they give of blood-red snow fields suddenly appearing without evident cause. At one moment a blue whiteness stretches away unbroken by any color save the opalescent lights that break and shimmer over the crystalline surface of the vast snow fields. Suddenly a blood-red color appears and spreads rapidly as if by some strange magic.

Just before Admiral Peary made his final dash for the pole in 1908, this phenomenon was observed. Some microscopic slides were prepared by Surgeon Goodsell and sent back as a scientific record of this famous "red snow," that had been reported from various places and under varying circumstances for nearly two centuries.

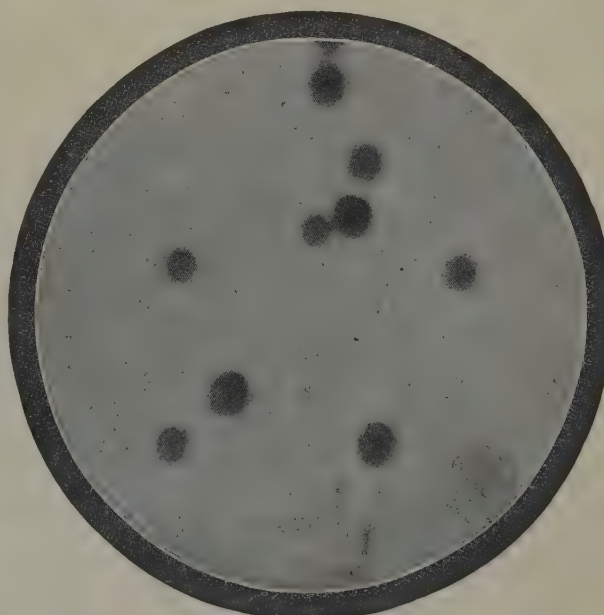
On the plateaus of high mountains travelers have told of coming upon miles of blood-red snow fields. In Greenland the color was so vivid that one explorer named the region "Crimson Bluffs." Small wonder that superstition has surrounded the appearance of this startling crimson snow wherever it has been observed and reported.

Numerous instances are on record of "red snowstorms." The first authentic report seems to be that of Dr. Saussure in 1760 when he found it on Mount Breven in Switzerland. Subsequently Ramond found it in the Pyrenees and Summerfeldt, in Norway. In 1818 an Italian journal contained an account of the fall of "red snow" in the Italian Alps and in the Apennines. About 1808, the whole country around Cardoce, Beluno and Feltri was covered in one "storm" to the depth of ten inches. A similar "fall" of "red snow" was recorded as occurring in Tolmezzo in the Friaul in 1803, and a still more remarkable "storm" is described by Agardh when he reports that the whole chain of the Apennines was covered. Captain Ross tells of a mountain in Baffin Bay, eight miles long, covered with "red snow." Darwin mentions having seen it in the Andes. As late as 1878, Brun noticed on the sacred mountain near the city of Ouessin, in Morocco, a so-called "rain of blood," which was undoubtedly of the same nature as



INTO FOUR

Each division acquires a new covering before dividing.



PHOTOMICROGRAPH OF THE PLANT

This is a picture of the little one-celled plant that causes "red snow," magnified 500 times.

This tiny plant belongs to the algae, the lowest and simplest in organization in the plant world, having no distinction of leaf and stem. Indeed it has but a single cell, less than one one-hundredth of an inch in diameter. To this single cell of protoplasm is added the red coloring matter called endochrome, and the plant, small as it is, bears the imposing name, *Protococcus nivalis*. When this cell is placed in water or in the presence of moisture, it grows by cell division, each cell dividing into two, four, eight, sixteen parts and so on, each division acquiring a new covering before leaving the mother cell. As each young cell emerges it is a complete individual and repeats the process of growth and rapid development. Thus, only a few hours are required for the spread of this plant over a wide expanse of moist surface. Hence

the tales of magic, of signs and wonders about this plant.

In the temperate zone, we have a closely related plant form (*Spharella lacustris*) found in small rock basins, particularly limestone ledges, filled by rain or the oozing water, but so shallow that they are frequently entirely dry in summer. Another member of this plant family has come into prominence through its bizarre and startlingly sudden appearance. The "Gory Dew," that overlies the grass of the plains at times, and has alarmed the superstitious, is still another alga called *Porphyridium cruentum*. This little plant, appearing at Hastings soon after the famous battle, was supposed to be "the bloody sweat of the earth crying to heaven for the vengeance of so great a slaughter."



THE ANGEL FISH

It may not seem to warrant its name but the uncolored picture does not do it justice. Its Latin name is *Angelichthys isabelita*.



THE SPADE FISH

The only common characteristics of the fish of the coral reefs are their remarkable colorings. The Latin name is *Chaetodipterus faber*.

LIFE AMONG THE CORAL REEFS

By DR. E. BADE

A BRIGHT, sunny light comes from the light blue heavens; soft warm winds pass caressingly over the deep blue waters of the tropical ocean. Everything is bathed in the intense light of the tropics, which finds its counterpart in the gayly colored animal life along the shores. Although all creation is under the far-reaching influence of the sun, nowhere is its effect so pronounced as in the violent daubing and tinting of the creatures inhabiting the warmest waters. With almost mathematical precision do the brightest and gayest colors increase as we pass from the poles to the equator, and here, in the tropics, the variety and intensity of coloration attain the highest and most marked development. The coral reefs with their bright, fantastic animal flowering stalks, among which myriads of colorful creatures are at play, surpass, by far, the floral carpets of the land.

When no wind ripples the water of the sea, when it is quiet, and peaceful, and still, and when the tropical sun fills the crystal clear waters with a mysterious glow, the surface of the reef is covered with thousands of flowery stars. Bud follows bud, and everything is brightly and gayly colored. But when the rising waves of the flood tides race madly over them, the water is dashed into foam and mist, submerging the beauty.

The most important builder of these underwater wonder gardens is the stone coral, which in formation resembles a gigantic mushroom carrying its umbrella upon a thin stalk. Others are quite different in their habit, being of unexpected richness of form and beauty. In general they may be block-like, bulbous or tuberous, flat or rounded, star-shaped or with interlocking and interwoven designs; still others are shrub and brushlike. All are marvelous.

There was a bit of furor in the Bade household. Some large glass jars had disappeared from the kitchen, mysteriously and completely. Finally they were found, playing host to the erstwhile denizens of a nearby pond. Young E. Bade had absconded with those jars so adapted to aquarium uses. It was a prophetic act, because he was to follow the path of a naturalist and this article is one of the results.



THE CORAL REEFS ARE RICH IN LIFE

With their fantastic animal flowering stalks and their myriads of colorful creatures at play, they surpass the floral carpets of the land.

In order to exist, all reef-building corals require a large amount of light, and they build only in that direction from which the greatest amount of light comes. Very few species will grow and live in semi-darkness. Because of their light requirements, the reef corals can live only in comparatively shallow water. As a rule they never go deeper than 120 feet, although a few reach to a depth of 180 feet. Only the outer part of the shell or reef is living, the interior is dead and is composed of calcareous shells. Then, too, definite demands are made on the salt content of the water and on its temperature. For this reason, under normal conditions, the reef building corals are not found north or south of the twenty-fifth parallel of latitude. Only where warmer currents of the ocean drift away from the equator can these animals find existence

in more moderate climes. The corals of Bermuda are in their most northern extreme in the Atlantic under the thirty-second degree of north latitude.

In former years it was the general belief that the corals had been built up from the bottom of the sea. Darwin, on the other hand, promulgated the theory, which is still accepted today, that as the islands slowly sank into the depth of the ocean, the corals built upward, thus keeping time to the extremely slow downward movement of their place of attachment. The island does not sink any faster than the corals grow upward. The sinking of the outer circle of the island is always equivalent to the upward building of the corals. Within the circle, partial equilibrium takes place as the waves wash in broken fragments of corals, marine refuse and sand. Should the island sink so that the highest peak just rises above the surface, then the island remains surrounded with a coral ring. But if this remainder sinks below the waves, an atoll is formed.

Therefore a coral reef consists of many thousands and millions of layers just as a high house consists of numerous floors, one on top of the other. Here life grows from the dead. The calcareous shells of the dead corals are the foundations of the newer generations which grow onward with undiminished vigor, ever striving upward towards the light which, when it is finally attained, kills them. When they have finished their short span of life, they continue, by means of the petrification of their structure, to help build the earth.

Reefs are built from stone corals which have a hard and brittle skeleton of lime. They never occur singly, but are always found in large congregations. Regeneration takes place through budding, and by this means they form branches of the most varied and curious designs. But all animals in one branch are connected by food canals so that the food taken up by one individual serves all. The lime secreted represents the greater portion of the coral branch, the individual animal itself being very tiny. Their growth is not so slow as is generally believed. Observations made with the coral (*Madrepora cervicornis*) show that it attained a height of three inches in a year. Much slower in growth than the branched coral is the



THE TIDE LEAVES A CORAL FLOOR

At the ebb there is left a hard, rough and pitted base of coral, and here and there in pools is sea life awaiting return of the waters.

with holes. The entire appearance of the surface of the reef resembles a gigantic sponge which has become petrified. The light silvery gray or yellowish color of the lime corals is interrupted, here and there, where water has collected in the depressions, by brightly colored sea weeds, a vegetation of red, violet, brown and green. In some places the gelatinous and slimy algae are exposed to the wind and lie upon the naked rock or corals, making the walking extremely difficult while the calcareous algae break with a loud, crackling report when stepped upon.

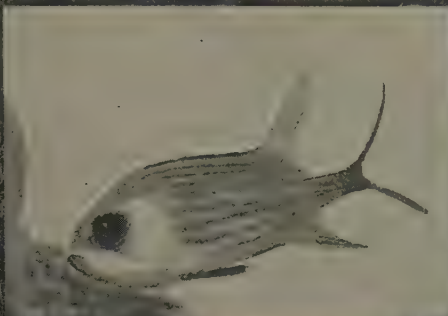
Of animal life, very little is seen while one is walking on such a reef at ebb tide. Here and there a few fish have been caught in some of the depressions and on being approached, dart to some hiding place. Crabs which have come upon the reef suddenly seek the water again. Only the snails of various sizes are not disturbed; they slowly crawl about or have withdrawn into their shells to await the flood tide.

The true animal life is found on the outer edges of the reef, where the corals grow and thrive. When these are covered with water and the sea gently swells up and down while the rays of the sun penetrate far into the depths as if with an exploring finger, then the reef is covered with millions of flower-like stars. Blossom seems to touch blossom, for the tentacles of the corals are stretched to their utmost, and give an impression of a profusely and luxuriantly planted garden. Entire forests of tubular worms are found on the shallow places and among them are seen sponges and ascidians. The tubular worms spread the beauty of their delicately feathered crowns, the ascidians unfold their tentacles.

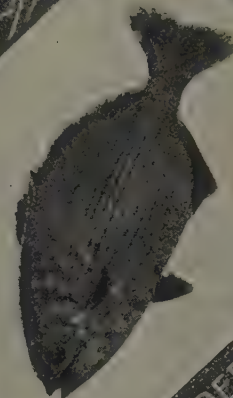


BLACK ANGEL FISH

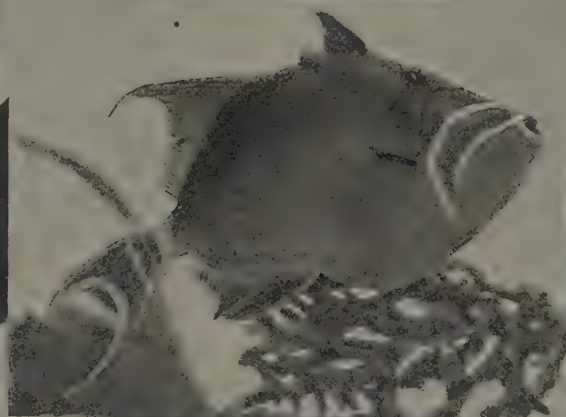
Known as *Pomacanthus arcuatus*, this is one of the many strange and interesting fish that live in the coral reefs.



SQUIRREL-FISH
Holocentrus ascensionis



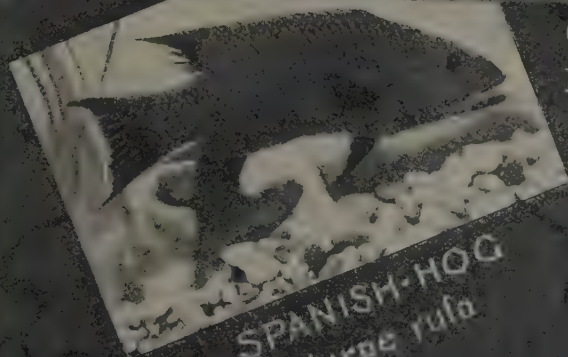
RUDDER-FISH
Kypbasas sepiatrix



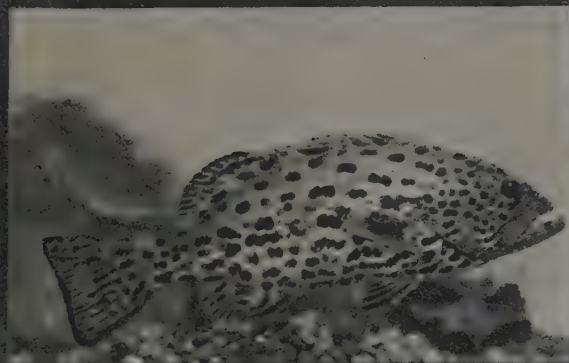
OLD-WENCH
Balistes vetula



WHITE GRUNT
Haemulon plumieri



SPANISH-HOG
Harpe rufa



YELLOW-FINNED GROUPE
Mycteroperca venenosa



GRASS PORGY
Calamus arctifrons



RED HOG-FISH
Lachnolaimus maximus

Where these creatures are exposed to movements of the water, they bend and rock their slender forms under its pressure just as do the land plants under the influence of the wind when it passes over the billowing meadows. Above all this indescribable beauty float the transparent, delicate bells of the jelly fish in rhythmic movements just as the gayly painted butterflies flutter over the flowering fields.

Schools of brightly colored, metallic shimmering fish of the most peculiar and weird forms glide through the transparent waters, through the curiously branched corals and into holes and cavities of the reef. These coral fish, living in the gayly colored world of the reefs, bring animation and life into the quietness, and when danger threatens, seek shelter in the many cracks and crannies found in their natural home. The only universal characteristics of these fish are their brightly colored bodies, their sharply defined stripes and the unique arrangement of their tints. Hand in hand with these peculiarities is their protective resemblance. Their bodies seem to glow with an internal fire and luster until suddenly they grow somber and resemble the white limestone sand washed by the restless sea into the crannies of the reef.

Star-fish which seem to be lacquered a red and blue, are everywhere. Snails with weirdly shaped shells or with houses of peculiar color and markings, and even those without a covering, go slowly about their daily tasks which are, only too often, to prey upon their less fortunate fel-

lows. Shrimps, with exceptionally long feelers and translucent bodies play in schools in the transparent waters. Agile crabs climb quickly and sure footedly about the coral branches, some fighting among themselves or lifting their claws threateningly against some fish which comes too close. To the smaller forms they pay but scant attention. They are everywhere among the corals, pulling on a coral here and there, drawing a worm from some chamber it had inhabited, and then again chasing each other playfully.

The coral fish play a very minor part in the scheme of things, even in the fisheries they are of minor commercial importance. Their meat is not tasty, and some have a poisonous and toxic effect at certain seasons of the year. The coral reefs are their hunting grounds. But appearances are deceptive, the luxuriance of life, which in these warm seas comes to its full development, is constantly destroyed, so that the favored few, the chosen, may live. The parrot fish (*Sparisoma*) has a modified mouth, shaped like a beak and very powerful. It easily breaks the protective covering of the corals and feeds on the animals; in fact its jaws are so powerful that it can break open hard-shelled mussels. Still stronger are the mouth parts of the species of *Balistes*, whose jaws contain eight strong cutting teeth with which they are able to break off large fragments of stone corals.

The coral fish do not belong to any special group of fish. Many families are represented and all have adapted themselves to a life among the warm waters of coral reefs.

Bird of Paradise Flower

By EDWARD A. PREBLE

THIS remarkable plant, which is a native of South Africa, has an interesting history. It was first described by William Aiton, an English botanist, in a catalogue of the plants growing in the famous Kew Gardens on the Thames. Finding the plant to be undescribed, he named it *Strelitzia reginae* after Charlotte Sophia, wife of George III, who devoted much of his leisure time to the improvement of Kew after purchasing it in 1789. It was at the suggestion of Sir Joseph Banks that the plant was named in honor of the queen's family, Mecklinburgh-Strelitz, which had done much to advance the science of botany.

Strelitzia is a perennial, springing from a strong fleshy root, and requires a rich soil, and abundant moisture and sunlight. It is in some favor, from its beauty and oddity, as

a house plant and for the summer decoration of lawns and porches. The lanceolate sepals are bright yellow, while the petals, which together form a tubular receptacle enclosing the stamens and style, are dark blue. In cultivation the flower is said not to produce seed unless it be fertilized by hand, a fact that suggests the possibility that in the state of nature fertilization may be effected by the aid of some insect which is absent in the plant's adopted home.

The illustration unfortunately does not show the leaves of *Strelitzia*. These are upwards of eight inches long, bright green above and glaucous beneath, and grow on petioles three or four feet in length. The plant is thus one of striking beauty, and well worthy to perpetuate the name of the royal lady who loved it long ago, and fostered it.



PHOTO BY INTERNATIONAL

THE BIRD OF PARADISE FLOWER

This is an interesting flower, not alone in appearance but in the history of its name and discovery.

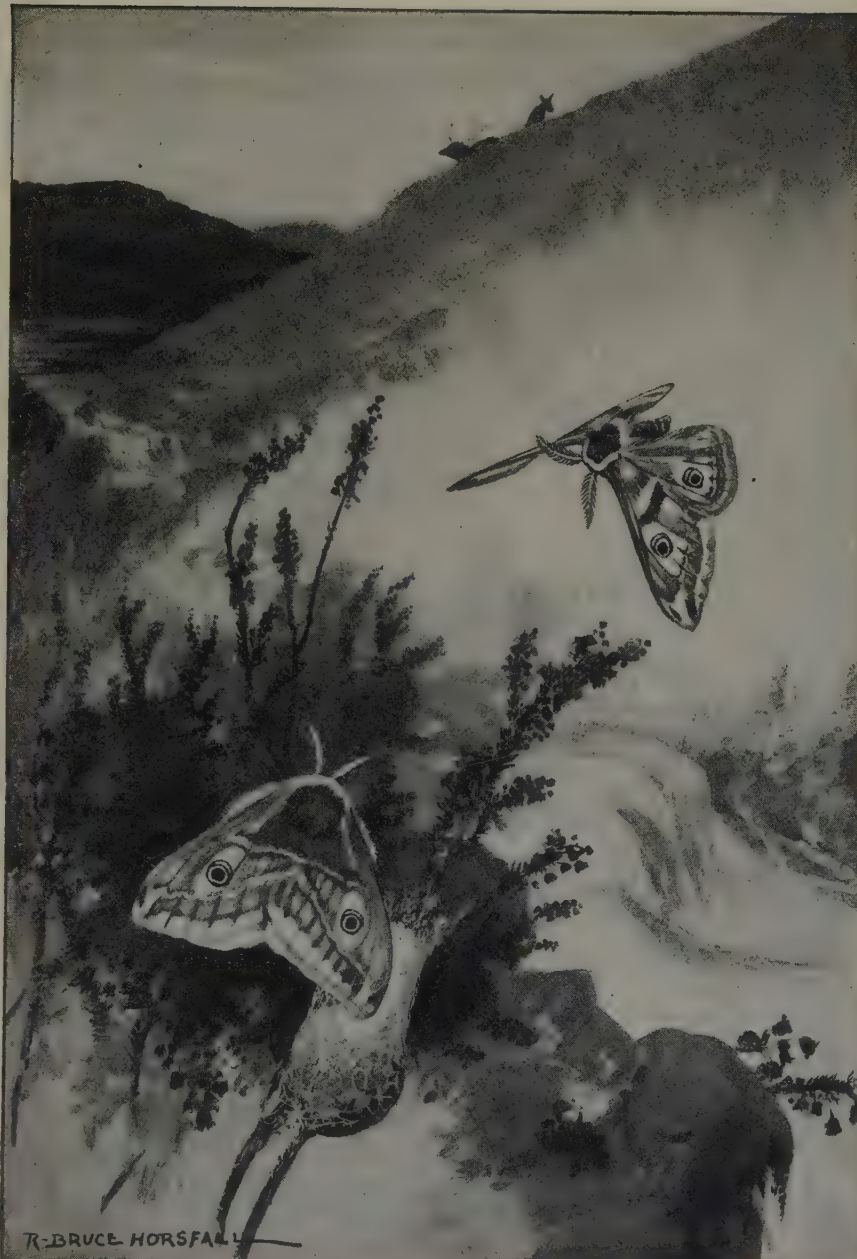
"At school the young naturalist became at once the terror of the dormitory and class-room, his pockets being seldom without their quota of moths or caterpillars, lizards and tadpoles, while in holiday-time he successfully maintained relations between a 'happy family' composed of an ancient hen, a rabbit, a tortoise, a hedgehog and a colossal Roman snail." We quote from a biographer of Hugh W. Shephard-Walwyn, British naturalist and author of this article. It is the first of a series obtained by special arrangement and constituting an interesting approach to the subject of Nature. Many of the references in this and subsequent articles of this series are English in character and terminology and no attempt has been made to "Americanize" them, since we believe that they possess their peculiar interest.

HARMONIES OF NATURE—SCENT

By H. W. SHEPHEARD-WALWYN

(Author of "The Spirit of the Wild," etc.)

HAS IT ever struck you what a very important rivet in the hub of animal existence is represented by the faculty known to mankind by the name of Scent? Oddly enough, there seems to be quite a prevalent delusion that the scent of violets, or the fragrance of the rose, were created for the express purpose of gladdening the heart of man. But let me assure you that Nature has never set up to be a charitable institution. She invariably has some private object for the scents that she concocts, whether pleasant or the reverse—whether harmonious or discordant to the senses of mankind. As a matter of fact, the fragrance of flowers was created for the sole benefit of those flowers themselves—as we shall see later on. If the lords of creation happen to approve of that fragrance, so much the better for them—if not, they must just lump it. There is no room for the spirit of altruism



"A THING OF TRANSLUCENT LOVELINESS, KNOWN AS AN EMPEROR MOTH"

in the kingdom of Nature.

It is difficult to imagine what the world would be like without scent. The fair sex at least would rise up in a body to declare that life unperfumed would prove but a barren and unprofitable existence. Strive to conceive the primrose-wood or violet-bed in spring bereft of their sweetest characteristic. Conceive, if you can, the Highland loch without its divine aroma of bog-myrtle, the wind-swept moor without that distinctive tang of heather and peat-smoke. As well try to imagine the average highroad without its odor of petrol!

The point, however, with which we are chiefly concerned at the moment is—how does this question affect the lower regions of the animal kingdom? We have all noticed the ridiculous way that dogs and cats seem to make it a kind of ritual to smell everything that they meet. But perhaps it is not so

widely realized that this custom is regarded as a necessary grace-before-meat in the daily routine of even the smallest and most insignificant of the dwellers in the kingdom of Nature. Have you ever heard the axiom that nine-tenths of the animal kingdom lives by its nose? How else will the glorious red deer receive the warning of impending danger, as he treads with stately step the boulder-studded ravines of his mountain fastness? What tells the prowling fox where leverets are lurking, or the toothsome partridge has concealed her nest?

What else enables the wiry weasel to follow with such unerring aim the trail of his tiny quarry through the most elaborate maze of cross-tracks and conflicting scents? How comes it that the squirrel has no occasion to open a nut to know whether the kernel within be sound? As for the mole—what other sense than this could enable that velvet-coated beastie to locate the precise position of a worm or beetle through walls of solid earth?

There is another side to the picture that seems to call for a moment's notice. If true that the animal kingdom lives by its nose, we may also find occasions now and again when some of them owe their lives to a remarkable inversion of that principle. In other words they owe them to a strange power that they possess of inflicting discomfort upon the noses of their enemies. A rather striking case of this comes back to my mind. Picture a wild, uncultivated slope on the Surrey

Downs, gay with scabiouses and marjoram and studded with huge ant-hills. A magnificent grass-snake held the center of the stage when I came upon the scene one afternoon in early summer. Coiled round, like the spring of a gigantic clock, on the summit of an ant-hill, he was basking peacefully in the sun which happened that day to be shining by accident. Now it is not usual for a hedgehog to be on the prowl in broad daylight, so that I was rather surprised when a sudden rustling in the bushes at one side proclaimed the

rapid approach of one of these determined enemies of every living thing weaker than themselves.

A good deal of action seemed to be crowded into the next second or two. Master hedgehog spotted the snake at once, and went for that ant-hill like a charge of cavalry. It was difficult to make out precisely what happened next, as a small bush obstructed the view to some extent, but I caught a fleeting glimpse of shiny, mottled coils slithering off at express speed through the long grass, while a prickly figure

executed a king of fantastic somersaults down the side of the ant-hill. At that instant the hedgehog had found himself greeted by the sudden volley of a stench beside which all the drains of a Macedonian slum might have paled into insignificance. The snake was well out of sight before the other had recovered from the shock—and it is to be hoped, for his own sake, that master hedgehog took the precaution to invest in a gas-mask before setting out to stalk snakes again! It should be mentioned that this reptile has no odor when happy and at peace with the world, but can switch it on at will for the confusion of his enemies.

Nevertheless, it is not until we cross the border into the land of moths and butterflies, that the faculty of scent will really begin to show what it can do. What would you think if an acquaintance were suddenly to march into your garden one day with the greeting: "Oh, I knew you were out here—I could

smell you half-way down the road?" Yet that would be mild compared with what goes on in the insect world. There are times when "half-way down the road" might almost be rendered as "half across the county." It may not be generally known that the smelling apparatus of a moth or butterfly resides in the antennae—or "horns," to borrow the title by which children are fond of describing the long, graceful feelers that these insects carry upon their heads. You have probably noticed at your window on some warm



"A PRICKLY FIGURE EXECUTED A KING OF FANTASTIC SOMERSAULTS DOWN THE SIDE OF THE ANT HILL"

September night a moth about the size of a primrose blossom, only somewhat darker in color, with eyes that glow like red-hot coals against the outer darkness, whilst upon his head he brandishes a brace of feathers, of a kind that put one forcibly in mind of those fearsome ornaments with which young ladies in busses have recently been doing such deadly execution amongst the eyes of their long-suffering neighbors. A quaint perversion of human customs, however, may be noticed in the fact that in this case it is the gentleman alone who makes a habit of sporting these beautiful feathers in his hat, those of his lady being comparatively small and insignificant—though perhaps it may not appear quite so strange in the light of the fact that these peculiar appendages might almost be regarded as the very mainspring of his existence.

The mainspring of his existence! A big term, no doubt—but then it is a big passion that governs the life of this throbbing atom of golden fluff. Remove those ponderous antennae, and you remove his means of gratifying that passion—the passion which may justly be described as the mainspring of existence to every living creature throughout the length and breadth of this wonderful kingdom of Nature. Bereft of his antennae, our little friend could never succeed in finding the lady whose mate he is destined to be!

Amongst the heathery hills and dales of Kent and Surrey dwells a thing of transcendental loveliness known as the "Emperor" moth. Great, round eyes, like those on a peacock's feather, adorn the center of each wing, from which a bewildering blend of reds and browns and yellows radiate in all directions like the pattern on a Persian carpet. The antennae of the male moth are shaped like tennis racquets, only with a broad central rib in place of the outer rim. With such instruments as these for catching the scent-waves which his empress broadcasts across the countryside, it is, perhaps, no wonder that the question of distance appears to be almost a negligible quantity. You have only to imprison one of these females in a gauze-covered box and set her down in an open place, and it will not be long before every man-jack of that species within a radius of a mile or two will have left his job and come trailing across hill and dale to reach the abode of the siren.

It would hardly seem fair to dismiss this fascinating subject without some allusion, however brief, to what harmony in scent has done for the vegetable kingdom. Everyone knows that flowers do possess scent, but it is not always so clearly understood how that scent contributes to the advantage of the flower that bears it. Do not imagine that it is with the object of doing the bees or butterflies a good turn, that flowers are in the habit of scattering odors of Araby in all directions to show them where the honey is to be found. While true enough that such fragrance is designed in the first place for the purpose of attracting insects, it is equally true that whoever takes that honey is not allowed to depart without paying the full price for it.

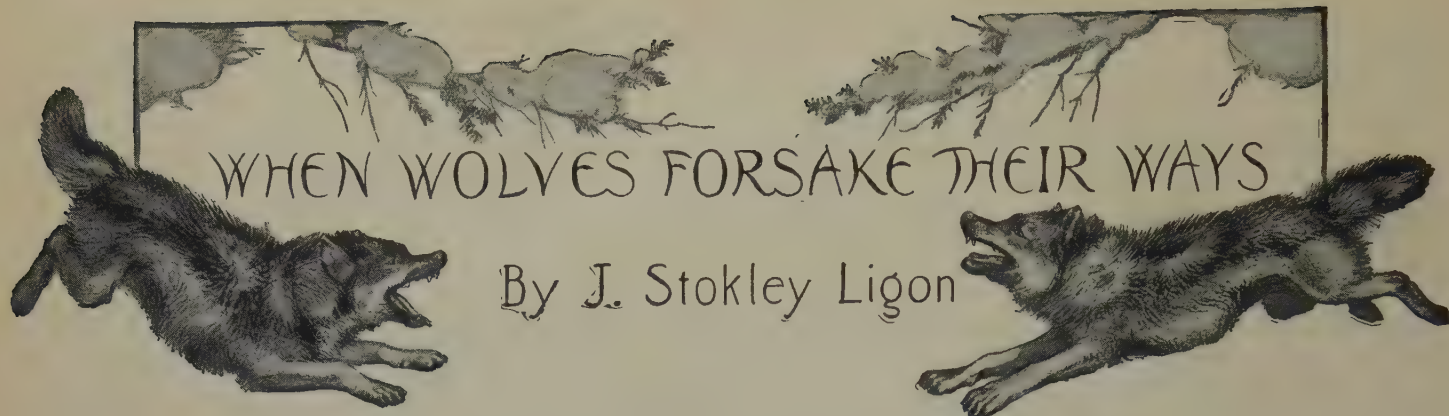
How on earth can they pay for it? you ask. Bear in mind that the majority of plants are entirely dependent upon the services of insects to fertilize their blossoms by bringing them the pollen dust from other blossoms, and that without this process not a single seed could ever be produced—and then the answer will soon become apparent.

Take the case of the common snapdragon—although the scent is not in this particular instance the most noticeable feature. It should be mentioned parenthetically that some flowers are very much respecters of persons. By no means at every house on his rounds will the bee, for instance, find himself regarded as a hail-fellow-well-met. Certain plants show a weakness for moths or butterflies, and cannot raise a civil word for the bees. For others it must be the bee, the whole bee, and nothing but the bee. Consequently, the great idea is to devise some means for presenting unwelcome visitors with the cold shoulder, while ensuring at the same time a warm welcome for those whose advances are required. Now the snapdragon happens to be a plant that appreciates the attention of the common or garden bumblebee—and his alone. Consequently it lays itself out to please the bumblebee—and him alone. Examine one of the blossoms closely, and you will notice that the upper part is shaped very much after the pattern of a fish's mouth, and will open and shut in the same manner when forced to do so. Observe, however, that it will never stay open of its own accord, the lower jaw being provided with a kind of spring which immediately snaps it to again. Such is the strength of this spring that a fairly heavy weight is required to work it. And the bumblebee is the only insect heavy enough.

Watch one at work amongst the snapdragons some day. Notice the unerring aim with which he invariably goes straight for the mark. No fumbling about to find the entrance—the snapdragon takes good care of that! How? By the simple device of hoisting up a sign-board—a sign-board as clearly legible to the passing bumblebee as the "in" and "out" notices at a railway booking office are to you or me. The only difference is that the bumblebee never disregards it. Have you ever noticed that the blossom of every snapdragon has a vivid patch of color at the entrance to its mouth? Always a different color, mind you, from the rest of the blossom—light yellow in the case of the dark ones and rich orange for the pale varieties. Bumblebees are particularly partial to bright colors. Beneath this sign-board is the platform provided by the lower lip of the blossom. His weight releases the spring on alighting, and the mouth automatically flies open. Things begin to hum after that—in more senses than one. Thrusting his way into the aperture, the visitor brushes off the pollen with his shaggy back, and receives his wages for the service in the form of a pleasant little drink of the nectar which he finds within. Passing on to the next blossom, he repeats the process here, incidentally leaving behind some of the pollen dust that he had brought from number one, which has the effect of fertilizing number two—and so on his ministering course he goes, bringing to each an offering of pollen from some other blossom and receiving from each another little drink in payment for his trouble. Both flower and insect are satisfied—and everything in the garden is lovely.

So much, then, for the influence of Harmony in Scent upon the Kingdom of Flora. Would that there were opportunity now to turn for a few moments to the other side of the picture, and show how here also Discord will be found to have its uses no less than Harmony. But this must rank with other conundrums which have to be left for future occasion, when we will hear more of Nature's Harmonies.





(ILLUSTRATED BY A FULL-PAGE INSERT IN COLOR FROM A PAINTING BY R. BRUCE HORSFALL)

WOLVES, the tenants of wild places and wide spaces, are frequently pictured, in stories that flash over the land to the reading public, as man-eating raiders of the northland. No place is so apt for the origin of such widely exaggerated reports as the Arctic and sub-Arctic regions, since in these remote sections there is little possibility of the fallacy of the stories ever being established. Their elusive source may be likened unto the proverbial rainbow's end. The truth of the matter is that we do not seriously endeavor to have them discredited. Who will deny that such stories thrill our fertile imagination and, beneficially, send our thoughts wandering through distant fields of adventure?

The wolf is and always has been symbolic of the savage and wild. He has some traits that enlist our admiration. His undaunted courage and muscular prowess would enable him to accomplish the ferocious acts credited to him. Neither is he above committing them, but he has better judgment than, as some would lead us to believe, to meet his enemy, man, with his death-dealing agencies, in unfair combat. But what he concedes to his arch enemy, he requires of other animals not so well endowed as himself with capacity for self-defense.

As with people, unusual conduct on the part of wolves is governed largely by circumstances. In fact there is a close similarity between them in many respects, particularly so

Mr. Ligon is a newcomer to the pages of NATURE MAGAZINE, and a welcome one. He has spent his life in the out-of-doors. Identified with the predatory animal work of the United States Biological Survey, he has ranged through the southwest, middle west and Lake states, meeting Nature as he went. Mr. Ligon is now on leave carrying on natural history field work.

far as killing is concerned. Almost invariably, it is either the ravage of disease or pangs of hunger that reduces the wolf to the poverty stage and prevents his leading a normal life. Wolves are not apt to be found anywhere in North America except where food in the form of wild game or domesticated animals is available. Therefore only the exercise of his normal strength and natural instincts is necessary to obtain it.

Normally, the life of the crafty wolf is spent largely in pursuit of his prey—on the hunt—in which he combines the business of getting food and reveling sport. He is urged ever by his eagerness and the desire to kill. When he forsakes his stern and dignified ways and voluntarily faces man, he is not a normal member of his proud race.

The islands of southeastern Alaska have been the scenes of unusual and pathetic conduct on the part of the big timber wolves, as well as the sad plight of the Sitkan deer, following the discovery of gold. Previous to the discovery of gold in the interior of Alaska, deer, though confined to the southern islands and adjacent mainland, were abundant, and the wolf experienced little difficulty in obtaining his desired food. During the gold rush and following this memorable period of want and suffering by man, deer were killed by thousands for food. Many thousands, also, were sacrificed for their mere seventy-five-cent hide. Naturally, this resulted in fewer deer, the wolf's natural food. It

"SOME BECAME BEACH-COMBERS."





"THE WOLVES ENCOUNTERED
A BEAR IN OPEN MUSKEG."

caused him not only to play havoc among their reduced numbers but to forsake his ways by seeking other food. The excessive hunting by both wolf and man not only threatened the existence of deer on all of the islands but resulted in their totally disappearing from some of them.

These islands, surrounded by water and the barriers of almost impenetrable mountains, largely forbade extensive migration of the wolves when in the face of this famine. It was while conducting wolf control operations in southeastern Alaska for the United States Biological Survey that the writer had an opportunity to study the unwonted conduct of these resident wolves and to gather much interesting history of their behavior.

The Alexander Archipelago of southeastern Alaska is composed of more than a thousand picturesque islands, snugly set along the coast. They range in size from a few acres to hundreds of thousands of acres. This enchanted coastal region with its mild climate, created by the southward sweep of the Japanese current, together with an abundance of rainfall, enjoys a luxuriant growth of vegetation and tree life. It is peculiarly fitted to the nature of the deer that dwell on the islands. Unusual congregation of game always invites natural enemies.

While wolves, normally, are dry-land travelers, water is not always a barrier when appetite or the desire for more extensive range dictate. In such cases they will cross wide expanses of water. Frequently, on these islands, they need only to cross mud flats or wade through shallow water when the huge tide of that coast is at low ebb. They soon learn to take advantage of low tides in traveling, even though they do not possess the accurate tide tables of the sourdough navigators. After the deer had entirely disappeared from an island, a few wolves often remained and

developed into "beach-combers," along with other scavengers—fish-crows, ravens, eagles and gulls—eating anything on which they could live. In some cases mange or other disease also reduced them to want even when suitable food was available—Nature's way of rendering justice between hunter and the hunted. Especially during the nesting season of ducks, geese and other wild fowl the unfortunate beasts would be active, prowling through muskegs and swamps and around the beaches and lakes, ravaging the nests and eating young birds. They would become so famished that during the running season of salmon they would seek the streams, killing many of the fish in their mad rush up the turbid streams to their spawning places. Even long after the spawning period was over, degenerated individuals would eat the remains of the decayed fish. In some instances the wolves dug out the decaying fish fertilizer from isolated garden plots of the native Indians. The Indian, however, soon stopped this by temporarily making his garden plot a trapping ground, sometimes securing the coveted prize.

The native village of Howkan, with nothing now to remind one of its former existence except moss-covered, tumble-down buildings and totem poles, was, over a period of years, the scene of interesting conduct on the part of prowling, hungry wolves. During this period chickens and dogs seem to have been their principal attraction. According to good authority, one year the wolves went to the extreme by killing every dog of that particular village. They also set many of the Indian fishing boats adrift, to be carried away

on the tide, by cutting the fish scented lines. Finally the Indians learned who was playing this trick and substituted chains for ropes. Strangely enough no stories survived of serious attacks on human beings by wolves.

At one of the granite quarries on Prince of Wales Island a wretched, emaciated wolf, with protruding bones and limp tail, became a regular visitor at the garbage pile near the mess house. At times he was seen slinking in the shadows or at the edge of the timber, but he magically escaped for a time with his abject life. Eventually, however, he was found in the deep quarry pit which offered no escape and the workmen humanely put an end to his miserable existence. On this same island wolves made a determined effort, under cover of darkness, to kill a span of horses which were used for transportation purposes over a long portage. The keeper of the horses, without a gun at the time, kept the raiders at bay by pounding on an old cross-cut saw for hours.

Time required in pulling down an animal seems to be of little concern to normal wolves when their killing urge and savage energy goad them to attack an animal many times their own size. One of the island trappers, while on his rounds, found mute evidence of a fatal conflict between three wolves and a black bear. On the snow one could read the story. The wolves encountered the bear in an open muskeg and were shrewd enough to avoid letting their captive reach the timber where escape would have been possible. The tracks of the wolves and bear, blood-stained snow and scattered hair disclosed the fierceness of the ensuing battle. The remains of the unfortunate bruin, scattered about on the edge of the muskeg, proclaimed the victors in the conflict. A few days before, wolves, and probably the same band, had completely eaten the carcass of a small bear which this same trapper had killed.

Zarambo Island, made famous by water of the same name—"water from under the sea"—had at one time been designated by the Government as a deer preserve. It became known locally as the "Government Wolf Preserve," so numerous had the wolves become. About this island, the



NORMALLY THE WOLF IS A DRY-LAND TRAVELER

But when hunger urges they may cross wide expanses of water to get to a place where there is promise of a meal.

shores of which are savagely whipped by stormy seas, have occurred tragedies of both land and sea. The bands of wolves which inhabit it gave much to its romantic history. Over its muskegs and through the timber, in early spring, four wolves pursued a doe to the head of one of the island's famous harbor bays. The doe, as is often the case when pursued by wolves, sought the water in a last desperate effort to throw off her pursuers, and was successful. The wolves stopped at the water's edge and howled ominously, as an expression of their disappointment over the sudden loss of a prospective meal. The doe swam several hundred yards off shore to an inhabited island where she received protection at a fox farm, and later was the proud possessor of a single fawn. In the autumn, however, she felt the urge to return to her more spacious habitat

and, with her fawn, swam back to the main island, and probably sacrificed herself and young to the howling band that had driven her into the sea.

But wolves do not always turn back at the water's edge when pursuing their prey, although it is improbable that they often gain by following deer into large bodies of water, unless they are successful in driving such animals to shore. Furthermore, it is doubtful whether a wolf can overtake a strong free-swimming deer. Still, we have one instance of fishermen who killed a wolf and deer swimming in one of the channels, more than a mile from the nearest land. The wolf was close behind the deer, but what would have happened had it overtaken the deer, so far out, is a guess.

While working on a tide flat at the head of one of the long inlets, a trapper and the writer heard wolves howl at intervals in the dense, dark timber that majestically folds in between the high tide line and the mountains that parallel the inlet to the west. Not expecting to have an opportunity to shoot a wolf, only a shotgun and five shells were carried at the time for the purpose of killing some ducks or geese for food. Two of the shells were loaded with buckshot and the others with small shot. Nevertheless, the trapper

decided to make a stalk under cover of the forest, believing that their frequent howling would guide him and enable him to get in close range of the wolves, provided they did not move too rapidly during the quiet intervals, as is frequently the case. He had been gone only a few minutes when two shots in rapid succession were heard. They were followed after a short pause by three others in quick succession and then yells from the hunter. Before the writer could reach the forest wall, the hunter rushed out bare-headed, his shock of sandy hair standing erect, carrying his gun barrel in one hand and the broken stock in the other. In wild excitement he related how from under cover of small jackpine he had miraculously approached the three wolves as they were playing on the new snow in a little open muskeg. A favorable wind permitted him to get near them without warning. He shot the largest of the three with one of the buckshot loads. It fell but was up like a flash, making it necessary to use the other heavy load to kill it. He then began firing bird shot into the remaining animal—one of the three animals having made its escape by this time—with but little apparent effect as it began to charge toward him. When his gun had been emptied and the animal had not been

checked, he changed ends with the gun, using the butt end for a club and killed the wolf, breaking the gun in the fight.

This story of the unusual conduct of the wolf made the writer suspect that the hunter might have misunderstood the intentions of this animal. The scene of the conflict confirmed his suspicions. A close examination of the animal explained its actions.

This wolf was a female young of the year, although it had attained almost its full size. Being taken unawares and in its excitement, it had unknowingly headed towards the concealed hunter, in its frantic effort to escape, after the first two shots were fired and the leader was killed. Although the bird-shot that hit the mark did not inflict instant mortal wounds, the animal had been entirely blinded. Its mouth was badly lacerated, causing the lower jaw to hang limp, thus giving it a raging, savage appearance as it charged headlong though helpless toward the hunter.

And so originate most of our North American wolf stories—just thrilling, though unusual happenings, which gain momentum as they fly, until with increased distance they assume the form of horrible yet somewhat exciting realities.

The Large Yellow Lady's Slipper

By LOUISE RAVENS

THE LADY'S SLIPPER pictured herewith grew, with six others, on the side of a deep ravine about sixteen miles north of Chicago, nextdoor neighbor to a group of splendid maiden-hair ferns. Its home is now in the hands of subdividers, a justification for picking so rare a flower.

In this section of the United States this orchid is almost extinct, though it formerly grew in abundance. In Indiana it was especially plentiful. A native of that state recalls that fifty years ago people dug the roots in great quantities, to be used for medicinal purposes.

The moccasin or slipper of *Cypripedium pubescens* is a pale yellow in color. In texture it surpasses the most finely woven satin. The inside of the slipper is delicately veined with wine-color and brown, and there are fine hairs to brush the pollen from the feet of visiting insects. The sepals and lateral petals are greenish brown; the latter are always twisted, reminding one of the curls which our grandmothers wore on either side of the face, under their poke-bonnets. Someone asks, "Why are they always curled and *what curls them?*" For answer—Why does the trillium have three petals and the hepatica



CYPRIPEDIUM PUBESCENS

This beautiful orchid was once plentiful in the middle west but is now rare and it is an event to find one.

many; what is the impetus which causes one petal to assume the form of an inflated pouch, a slipper; what is the secret which enables the brown earth to fashion from itself this superb and unique blossom? It is the old, old story; the riddle of the universe.

The rarity of these exquisite orchids is due partly to the fact that fertilization is effected mainly or entirely by insects. The peculiar structure of the flower makes it essential that it be visited at the proper time by the right insect, and even then failure may result. The spread of a colony may, however, be facilitated if the flower lover will assist Nature by a judicious manipulation with a pencil or similar instrument in such a way as to insure some of the pollen reaching the stigmas.

It is safe to say that there are few wild flowers of such distinctive grace as these moccasins. One comes upon them in their native haunts with a sense of awe. They are like vestal virgins holding aloft a pure and sacred flame. Happily the period of bloom of an individual blossom extends over several days. One may return again and again to worship at the altar of its exquisite beauty, for it is worth worshipping.



THERE IS NOTHING DOWNY ABOUT THE NEWLY HATCHED OSTRICH

Its mottled brown body is covered with stiff little feathers that feel as though the chick were clothed in excelsior. An ostrich egg weighs from three to four pounds equal to about thirty eggs of the domestic fowl. It takes forty-two days or six weeks to hatch. The natural nest of the ostrich is a slight hole scratched in the sand. The male does a good part of the incubating. The youngsters are able to run about soon after they are out of the egg, and to fend for themselves.



THE OSTRICH IS THE LARGEST BIRD LIVING AT PRESENT

A fully matured specimen stands about eight feet and weighs about three hundred pounds. The chick on the opposite page would come about to the lower leg joint of one of these birds. The proverbial story that the ostrich hides its head in the sand thinking to conceal itself has been disposed of and stored away with other Nature myths. The ostrich is a curious bird, with a maximum appetite and a minimum amount of discretion. It will eat anything from an orange to a door-knob.

Winter Bird Group in the Yosemite

By ENID MICHAEL



MOUNTAIN CHICKADEE

He is always the first to dive down to the feast.

DURING the winter months when the south side of the Yosemite Valley lies in the shadow of the great south wall, and when bird food is scarce, the birds concentrate on the warm slopes of the north side of the Valley. The district about the park zoo is the particularly fa-

vored spot, for here the birds not only find warm sunshine but food in plenty. It is here that Robert Selby, the keeper of the zoo, has daily spread a generous table for his feathered friends. Ceanothus and Manzanita bushes close to the food tray offer the birds a safe retreat in case of danger. And the little brook that flows through the zoo and wanders down the sandy slope, forms many a delightful bathing pool.

Each year the number of birds about the zoo increases, and each year they become more trustful of man. Our daily walks about the valley frequently take us here where we can always spend a profitable hour or two learning the ways of birds.

Mr. Selby has made it a habit to feed the birds at eleven o'clock each day and his boarders have learned to time him well. When he arrives with his sack full of bread the birds gather at the feeding station. They sit around patiently, and otherwise, in the bushes waiting for him to crumb the bread. The mountain chickadee waits impatiently and is always the first one to dive down as soon as Mr. Selby steps back. He doesn't hesitate but grabs his crumb and makes off with it into the bushes.

The juncos move in quietly, nor do they hurry off, so as many as a dozen are often feeding close together. There is one slate-colored junco that

lives with the great flock of Sierra juncos about the zoo. Being a stranger to the valley, and wearing a slightly different garb from the Sierra junco, he receives a certain amount of heckling. But when the Sierra junco gets too fresh he shows his spunk and stands up in a bill-to-bill fight. In these encounters he is usually victorious.

The juncos feeding peacefully give the others courage. Soon the shy Sacramento towhee is among the diners; and with him often arrives the Lincoln sparrow. It is a treat to get intimately acquainted with this rare sparrow. He closely resembles the song sparrows with his plaintive voice—we say that he has tears in his voice—and the dark spot on his chest set off by beautiful penciled markings. His coy, wren-like manner, too, reminds us of the other bird. He and the towhee are wonderful at thicket threading. They pass through dense tangles as easily as a ray of light.

We once saw a towhee tease a sharp-shinned hawk. The hawk dived at the towhee in the bushy crown of a young oak. The towhee slid through the cover to the other side and perched on an exposed twig seeming to laugh at the hawk as he clumsily strove to follow. When he approached too close the towhee slipped through to the other side again. Few birds have the nerve to play tag with this grim killer, but the towhee continued the game for several minutes before he tired and dived off into another thicket.

From every bush comes the harsh scolding note of the



THE WESTERN ROBIN COMES

He arrives after the feast begins, surveys the situation in a lordly way and then tastes the meal.

blue-fronted jay. The jays are very suspicious birds and wait cautiously to see if anything happens. If nothing startling occurs they dash into the bush near the crumb pile. They continue to scold while they scan the spread with keen eyes. Then dropping to the ground they make one or two cautious hops, ever ready to spring away. Now one, perchance, may pose upon a stone and seem thoughtfully to meditate upon this grave chance. At length one crested beauty, having gathered his courage, grabs the biggest crust in sight and dashes back to cover where he may eat in safety.

The lone western robin, a beautiful male,

his leisure. When one of his intended victims moves along the little highwayman's perch he pounces upon it and the surprised bird forsakes his crumb. With the captured prize the robber retires to some tree or bush, where, perched on a limb, he holds down the crumb with his foot while he daintily picks at the morsel in the clever manner of the jay.

This is the usual peaceful scene, but on more than one occasion tragedy has thrown the feathered company into wild panic. Where birds congregate in such numbers enemies are sure to be attracted. Their enemies are both four-footed and feathered. The feathered enemies



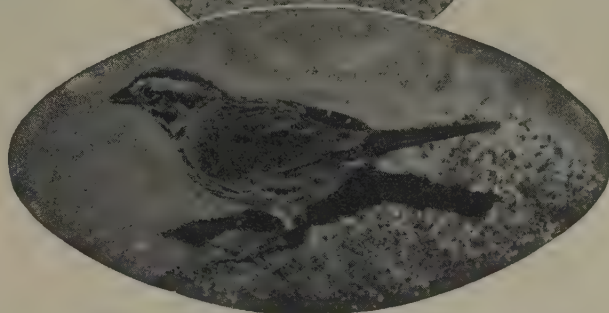
THE SACRAMENTO TOWHEE IS SHY

Below the rare Lincoln sparrow feeds, a delightful bird with a voice that seems to have tears in it.



SIERRA JUNCOS FEED PEACEFULLY

In the center the blue-fronted jay waits suspiciously and cautiously to see what happens.



comes after the feast is well begun. He flies from his perch in the oak tree and with a few easy hops he comes to perch on a stone. With the lordly manner of an owner, his fat stomach stuck out, he calmly looks the situation over. He flicks his tail a time or two, and chuckles, then steps deliberately forward to gather in the raisins. After eating four or five raisins and a mouthful of crumbs, he flies back to his perch in the oak tree.

One lone titmouse lives about the zoo and grows plump on Mr. Selby's generosity. He is called plain titmouse, yet he wears a crest, and in character he is somewhat like the big-crested jay: he is very suspicious and loath to come to the food tray when any one is about. A cute fellow he is, with piratical tendency. Too wary to come boldly to the food tray for his share he waits in the nearby by bushes to pounce on some chickadee or junco who has been to the crumb pile and has retired with a nice fat crumb to eat at

are the Cooper and the sharp-shinned hawks, and often we have seen one of these birds strike down a jay. Strange as it may appear, we make no attempt to warn the feeding birds or to drive away the hawk, but, the hawk is a bird, and an interesting bird. It is his nature to prey on birds and by dire necessity he must feed on birds in order to keep body and

soul together. We feel that hawks have their niche to fill in the avifauna of our national parks.

With cats, however, it is different. While it is true that house cats by nature also prey on birds it is not a matter of life and death with them. They can be fed at home, and besides they have no place in the fauna of our national parks. Every day in Yosemite National Park birds give up their lives to satisfy the hunting instincts of some domesticated cat. Cats turned loose in a bird sanctuary! Dogs not permitted! What a fine time the cats do have, protected from their natural enemy, and allowed to range about as they wish.

What do the bursting buds of springtime tell you? The April issue of NATURE MAGAZINE will contain an attractive article on trees and their buds. How are pearls made? Dr. Paul Bartsch tells the fascinating story of pearls in the April number. Have you ever heard the early morning song of the violet-green swallow? Whether you have or not, R. Bruce Horsfall tells charmingly of it in an article that is illustrated by a reproduction of another beautiful painting in color.



PHOTOGRAPH BY L. E. GRACE

TO A TIMBERLINE TREE

By GUY C. CALDWELL

Funny pigmy of a tree,
What can life have meant to thee,
Struggling from the hour of birth,
Reaching down for mother earth.

Fighting wind and frost and ice,
Seeking no matured advice,
Clinging tight to rock and boulder,
Every season growing older.

Baby arms have held at bay,
Icy blasts that raged all day.
Handicapped by lack of earth,
Shrunk thy body, slimmed thy girth.

Here's a mystery indeed,
What becomes of thy good seed?
Does the wind transport it down
Where upgrows a taller crown?

Now I see thy purpose clear,
And thy life is not so drear.
Through this struggle for existence,
Tens of thousands bless thy presence.

Seeding valley and ravine,
With thy children tall and green,
Thou art Mother Conservation,
Making rich each generation.

THE CHARACTER OF TREES

By Wallace Hutchinson



"Character" has several definitions, one of which is "a symbol." Trees lend themselves to symbolism to a high degree, and, at the same time, they possess character in the common usage of the word. Wallace Hutchinson, the busy public relations chief of the San Francisco office of the United States Forest Service, has written this charming article to prove this. Mr. Hutchinson has done notable work on the Pacific Coast.

TRULY a tree represents something more than the amount of lumber it contains. The timber cruiser may estimate the number of feet a standing tree will produce in the market. The lumberman at the mill may figure the number of feet of dressed or undressed lumber a log will work into. The cabinet maker may study the grain

writhe and twist as if in mortal agony. It sings of the nest snugly built amid the branches, and of the little nestlings that took their first lessons in music when the soft winds crooned their lullaby amid the leaves. Every fiber in the wood vibrates and throbs in unison with the strings as the bow is deftly drawn across them by a master hand. It tells the secrets of the forest through the wood of the violin.

Trees have an individuality all their own. To John Keats they were "As those green-robed senators of the mighty woods." Lowell saw in the birch, "The shy and most lady-like of trees." George William Curtis wrote, "A stately elm is the Arch Bishop of this green diocese;" and another writer says, "Their fronded tops point heavenward like cathedral spires."

In all walks of life we find the sublime and the ridiculous, the stately and the grotesque. So it is with trees. Sometimes we find them fashioned in such queer shapes that they seem the very harlequins of arboreal beauty. The live oaks on the University of California campus at Berke-

The picture above is that of a beautiful stand of California Redwoods dedicated to the contributions made to forestry by Col. Henry S. Graves, Dean of the School of Forestry at Yale University and former Chief Forester of the United States. The grove stands on the famous Redwood highway and has been purchased through funds given to the Save the Redwoods League by George Frederick Schwarz of New York.

for effect when made up. These are views through commercial eyes, but the Nature lover views them as God's exquisite handiwork.

One can find "genuine companionship in trees if one chooses, for there is a sort of brotherhood existing between trees and men. Trees are God's own musical instruments. Milton phrased it when he said, "Cathedral organs give forth no music grander than that which sounds when a forest of pines awakes at midnight, to chant a solemn psalm of praise."

The wood of a tree fashioned into a violin and placed in the hands of a Paganini laughs or sobs with the mood of the master. It sings of the raging tempest when the lightning flashes its crooked scimitar across the sky, and the branches



WILLOW AND SYCAMORE

Truly a tree means more than the
lumber it contains.

They are a striking example of this. Dedicated to the La Conte brothers, formerly teachers at the university, they are caricatures of their cousins the white oaks. Gnarled and twisted and bent like the knotty fingers of old age, they seem to cower and cringe like court jesters in the presence of the stately and majestic eucalyptus that rear their mighty heads towards the clouds, swaying backward and forward at the caprice of the winds like court-gowned ladies in the stately figures of the minuet.

On the seventeen-mile drive at Monterey, California, many live oaks cluster together as though they had been segregated from other trees on account of their deformity. In such fantastic shapes are they that one feels that Nature fashioned them in this grotesque way as a penalty for breaking some of her laws; that she ordained that they go through life like Richard the Third, deformed, unfinished, and misshapen, a jest to every passerby.

There are trees to which old age seems to have come prematurely. At least they have that



WINTER ADORNS THEM IN NEW DRESS

One can find genuine companionship in trees if one chooses to seek it.

PHOTOGRAPH BESSIE L. HALLOCK

appearance for they are bearded like patriarchs of old, the moss hanging in festoons from their branches like wisps of trailing lace. There is the pathos of the dead tree whose trunk and limbs are bleached to a gray, pallid whiteness by the elements. Standing alone against a background of its green and well-dressed fellows, it seems to reach out its shrunken arms in supplication, mourning for its glory long since departed.

Trees are like humans. Some seem to love to congregate in groups and hold communion with each other as their arms touch and intertwine. Others stand by themselves aloof, as if they felt superior to their companions, and look down from their lofty height with contempt upon their less stalwart brethren. On the edge of Crater Lake, Oregon, in the midst of upheaval of mighty rocks, stands a solitary tree that seems as if planted there in that desolate place by the Almighty as a silent watchman standing like a sentinel guarding the lake whose waters are as blue as the sky above.

Some trees are marvels of



MOSS HANGS IN FESTOONS, LIKE WISPS OF TRAILING LACE

PHOTOGRAPH INTERNATIONAL

Without trees we cannot be sentimental about them and this would perhaps be the greatest loss to us from the using up of our forest resources that are rapidly giving way to the demands of civilization.

wonderful coloring. The glory of the October maples are beyond the tongue of man to describe. When the frost king has spread his colors on his palette, and painted the leaves with all the blending colors of the rainbow, they wave in the breeze like billows of lambent flame, and the hillsides look like one vast canvas of color painted by a master artist.

Some trees seem to glory in their height and girth; such are the mighty redwoods of California. The "Grizzly Giant," that patriarch of the Mariposa grove, may be the oldest living thing on earth today, and was a strong sapling, or young tree when Christ was on earth. It is thirty feet in diameter, its largest limb is six feet thick, and its height is two hundred and four feet. The storms of the ages have demolished its crown, but it is hale and hearty, and likely to survive for centuries yet to come. What a story it could tell of the ages that have passed since it was a young sapling.

The manzanita is an extremely crooked tree, or shrub, although they have been known to a height of thirty feet. People visiting California from the east often take back as a souvenir a cane cut from this tree. The more crooked the stick, the greater to be prized, because it is next to impossible to find a branch two feet long that is at all straight.

The Jeffrey pine seems to demand little soil for its sustenance, for they have been found growing from the crevices of rocks, and must draw their nourishment from the rocks themselves, because the soil is not deep enough to conserve

even the moisture of the atmosphere. It is, of course, stunted and deformed from undernourishment, but it still continues to flourish under adverse circumstances.

The paper birch is one of the most beautiful of trees, its soft satiny bark exquisite compared to the rough bark of the hickory. The gleam of its creamy white color may be seen as far as the eye can reach, for it stands out strikingly against the background of its green fellows.

One day I wandered into the woods, and hearing the sound of an axe deeper in the forest ahead of me, I followed the sound. Presently I came to a small clearing where two men were plying their axes upon a mighty oak. They did not see me approach, and I stopped at some distance from them to observe their work. The thud of the axes jarred upon me, adding discord to an otherwise perfect day. The clean white chips flew in all directions, and the sap oozed from the deep cut like blood from a wound. The keen-edged axes bit deep into the heart of the tree, until at last it could stand the unequal contest no longer, and began to sway and tremble like a warrior stricken in battle. Slowly, majestically it toppled, held for an instant fighting for its life, then with a mighty rending it swooped, and I placed my hands over my ears, that I might not hear it groaning like a soul in agony as it crashed full length upon the ground.

Nothing could be more pathetic than this fallen monarch. For years it had stood in its giant strength, defying the elements, its topmost branches looking out over hill and valley,

and swaying in rhythm to the toss of the winds, or lashed to fury by the storms that swept over it. Birds had sought its branches for protection, and built their nests and reared their young safely amid its foliage. Now for the few paltry feet of lumber it would furnish to make my lady's dresser, the axe is laid at its feet, and it fell like a gladiator.

Since the world began trees have been revered by many peoples. In the ancient folk lore of Palestine, the olive tree was considered holy, giving food in fruit and oil. Whoever cut it down could expect no peace of mind thereafter.

Our Bible mentions trees in many of its chapters. "The tree of life in the midst of the garden; the tree of knowledge of good and evil," and many more from Genesis to Revelation.

One of the bishops of the Methodist Church was a great lover of trees. He was wont to talk to them as if they could understand what he said, and he often remarked that he must have druid blood in his veins, for he considered every tree his personal friend.

With good reason the tree has been selected as one of the most



WE FIND THE GROTESQUE, ALSO

Yet there is a stateliness about this old warrior who has fought the elements and lost.

expressive and fitting memorials. It lives, grows and seems to perpetuate more vitally than marble, the memory of the one to whom it is dedicated. Roads of Remembrance have been planted in many parts of our country in honor of men who gave their lives in the world struggle, to men and women who by their works have left heritages to posterity. The tree is a fitting memorial to achievement, because it continues to achieve.

Mayhap these passing thoughts of trees—these thoughts of trees in passing—are sentimental. So be it, sentiment is still permitted us. And, too, in passing, there is the practical side of the service that trees have rendered in the building of our nation. We have been too little thoughtful of their future in accepting this service, and through these thoughts of sentiment on the one hand and use upon the other must come to us the truth that we must turn our hands and our thoughts to conserve and recreate that there may be trees for the future—trees of beauty and character.

Without trees we cannot be sentimental about them, and perhaps this would be the greatest loss of all, to all the tree lovers.

A Versatile Crow

By GRACE F. HADLEY

JIMMY CROW was brought from the country when only a few days old. His only food for days were fish worms, raw meat and bread crumbs soaked in milk. Many times during the day he was taken out of the box, and exercised his wings and legs. A few days more and he was able to hop on the edge of the box unassisted. Each day he ventured a little farther, flying back many times and seeming to try to tell us where he had been.

On rainy days Jim was busy playing with toys, among them a rubber ball. He would bring bones and food to play with. He loved to hide things. Jim would pull the corner of a rug back with his bill, stand on the rug until he put the article under, then step off and let the corner flop back. He would

follow us down the street, walking on the pavement just behind us or at our side. When I drove, he would fly just behind the car, alongside or over the hood.

If a tie or a shoe string were handy, Jim did enjoy untying them. Candy he would take from the lips and never once touch the lips. These are only a few of Jim's tricks. But on wash day he had to amuse himself alone, shut up in the basement. This peeved him very much, but it was a case of have-to, or do the washing over. Left out, he would take the pins out as fast as one could put them on the clothes. He would catch on the garments that hung close to the grass with his bill and feet and swing merrily for several minutes. So it was the basement for Jim on Mondays.



JUST JIM CROW

He came into the family when a few days old and there remained, an honored member.

Crocodile Lizard—A Rare Specimen

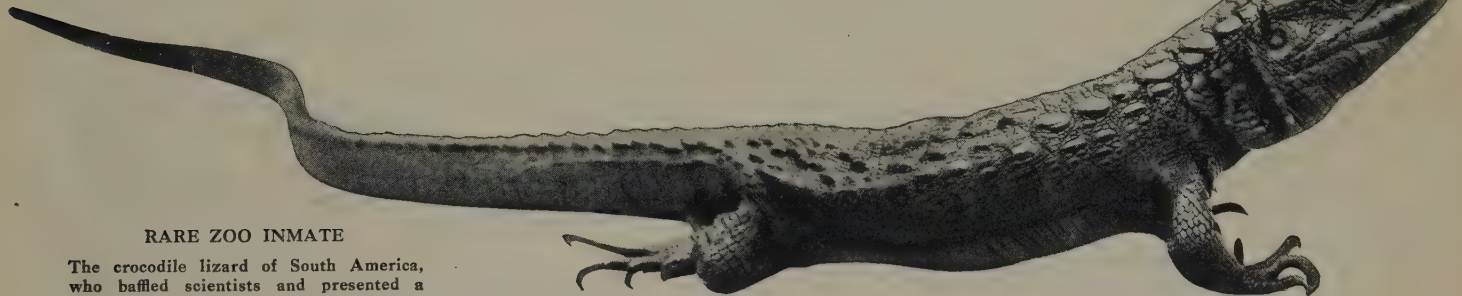
By H. S. BRYANT
Of the United States National Museum

EARLY in November there was received at the National Zoological Park in Washington, D. C., a peculiar looking lizard which was so rare a specimen that for a time it was not recognized. It was at first thought that the animal might be entirely new and undescribed. The searching eye of science has dispelled the mystery which at first surrounded the lizard, although much speculation concerning its identity was at first indulged in even by those more or less expert in such matters. Dr. W. M. Mann, Superintendent of the Park, states that as soon as opportunity was offered for its thorough and careful examination, the animal was definitely identified as the rare Crocodile Lizard of South America which rejoices in the scientific name of *Dracaena guianensis*.

The fact that the animal has been definitely placed in its

Baths of milk have been generally considered the prerogative of actresses with an eye to publicity. When, however, a rare lizard, recently arrived at the National Zoological Park in Washington, was accorded such a distinction, newspaper reporters were rushed out to record the event. Mr. Bryant of the U. S. National Museum tells us about this distinguished lizard in the accompanying article.

gray, brown, green and even an occasional pinkish tone may be noted. Superficially it resembles the large iguanas of South America, but it is notably different in having a series of keels, or what might be termed scales set on edge, running in two rows down the back and along the tail. These keels and the fact that its back is covered with large plates give it a strong resemblance, dorsally, to the alligator or crocodile which accounts for its common name of Crocodile Lizard. While the lizard in the Washington Zoo is said to have come from the basin of the Orinoco River, the fact that the type or Paris specimen came from Cayenne in French Guiana while others have been collected on the Amazon, indicates a wide range of habitat. Little, if anything, is known as to the habits of the animal or, at least, nothing concerning them



RARE ZOO INMATE

The crocodile lizard of South America, who baffled scientists and presented a problem in dietetics.

proper pigeon-hole in the file of zoological nomenclature does not detract from its importance as an acquisition to our national zoological collections. It is still one of the rarest of rare animals in captivity. In fact, except for one other received from South America in the same shipment and disposed of in Philadelphia, there are no other specimens of the beast in this country, and probably no living specimens of it anywhere except in its native haunts. Strange as it may seem, however, this particular lizard has been known to science since 1788 when it was first definitely described by de Lacépède from a single specimen in Paris. He, however, confounded it with the East Indian *Varanus* which Linnaeus, the great Swedish naturalist, had already described as early as 1766 under the name *Lacerta dracaena*. It was not until 1803 that Daudin, apparently with both specimens before him, discovered the distinction between the Bengal or Indian specimen and the one from South America. As he found them to represent different genera he gave the South American lizard the name *Dracaena guianensis* and the one from India the name *Tupinambis bengalensis*. The latter, or specific, name in each case indicates the locality whence the specimen came.

The specimen in the National Zoological Park is about 30 inches long, approximately half of this length being its long, slim tail. In color it is olivaceous brown on the back from head to tail, the color fading to a mottled effect on the sides and under parts and feet where varying shades of olive,

has appeared in print, excepting the brief statement of M. de Laborde who forwarded the original specimen to the Paris Museum, to the effect that it lived in the marshy savannahs, being equally at home in the water or on the land where it retired in holes and the female laid many eggs.

With no information at hand as to the habits and food of the lizard, the task of keeping it alive is a difficult problem which is engaging the serious attention of the zoo staff in its endeavor to preserve so rare a specimen for further and more careful study.

Every delicacy known to the élite of lizarddom has been tried unsuccessfully until the bill-of-fare has reached an imposing length. Fish and bananas, the staple diet of similar animals in their native haunts, have been spurned and experiments with lettuce, mice, meat, eggs and shrimp have met with no better success. Noticing that when it submerged itself in water the reptile would open its mouth and apparently drink some of the fluid, Keeper Blackburn tried the experiment of placing the lizard in a bath of milk in the hope that it might imbibe some of the liquid and thereby derive some nourishment.

By virtue of that faculty which enables such creatures to survive through seasons of cold or dryness, it still lives, and apparently is in good health. But since this cannot go on forever the authorities are still hopeful that experiment will discover some acceptable and nourishing diet.

CANCER, THE CRAB AND THE MARCH SKIES

By ISABEL M. LEWIS

THE CONSTELLATION that we have chosen for special study this month may seem, at first thought, to have little to recommend it to our attention. It is, to be sure, one of the twelve constellations of The Zodiac, that Belt of the Heavens which lies along the ecliptic, or apparent yearly path of the sun, and in which the moon and planets, as well as the sun, are always to be found. Cancer is, however, the least conspicuous of all the zodiacal constellations. It has no stars brighter than the fourth magnitude and no very distinctive form. It can best be located by its position midway between the two conspicuous and easily recognized zodiacal constellations of Gemini, The Twins, and Leo, The Lion.

For all of its lack of stellar splendor Cancer seems to have won its full share of attention from the ancients. Here, according to the Chaldeans and certain Greek philosophers, was located "the gate of men" through which souls were believed to descend into human bodies. In Capricornus, which marked the limit of the sun's excursions south of the equator as Cancer marked the limit of its northern excursions, was located "the gate of the gods" through which the souls released by death returned to heaven. Our Tropics of Cancer and Capricorn received their names from these two constellations at the time when the sun was in Cancer at the beginning of summer and in Capricornus at the beginning of winter. Now the westward shift of the celestial equator along the ecliptic, which is called "The Precession of the Equinoxes," has brought the sun into Gemini at the beginning of summer and into Sagittarius at the beginning of winter.

Although it has no bright stars, Cancer has one object of special interest, a coarse cluster of stars known by the name of Praesepe, The Bee-hive, or The Manger, which can be seen to fine advantage with opera-glasses or the smallest telescopes, using the lowest-power eye-pieces. Its many stars of the seventh and eighth magnitude need but little optical power to bring them into view and the group is well worth hunting for. The two inconspicuous stars shown on the chart to either side of The Manger are known as "Aselli" or "The Asses." On a clear, dark night when there is no moonlight to dim the light of celestial objects, Praesepe may be seen with the naked eye as a faint, nebulous cloud of light. As the least gathering and condensation of vapor in the atmosphere hides Praesepe from view the ancients looked upon the dimming of its light as an infallible sign of approaching storm.

The Greek poet, Aratus, who wrote a poem upon the prognostication of the weather, as well as upon the constellations, gave the following directions for predicting the weather from observation of Praesepe and Aselli which some of our readers may test out some clear night in March.

"A murky manger with both stars
Shining unaltered, is a sign of rain.
If while the northern ass is dimmed
By vaporous shroud, he of the south gleam radiant,
Expect a south wind: the vaporous shroud and radiance
Exchanging stars, harbinger Boreas."

It has been suggested that this constellation received its name of The Crab originally many centuries ago from the fact that then, when the sun was in this constellation at the time it was farthest north of the equator, its daily change in position in a north and south direction was very slight so that it seemed to be moving slowly in a sideways direction very much in the manner in which a crab crawls. As the sun is no longer in Cancer when farthest north of the equator at the beginning of summer the name has now lost its appropriateness. The old mythology which has so

N. much to say about the stars tells us that Cancer

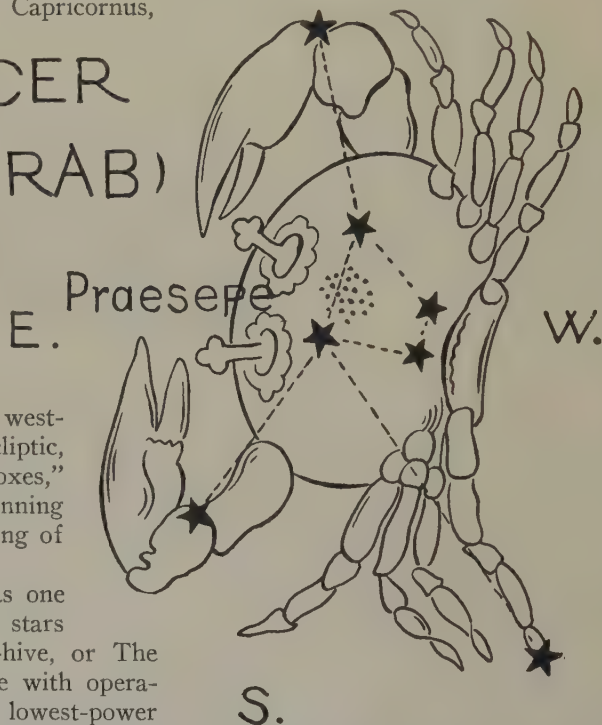
was the crab sent by Juno to annoy Hercules when he was fighting with the many-headed serpent in the Lernean swamp. When Hercules crushed him with a single blow the goddess rewarded the creature by placing him among the stars.

Those who know the stars in their seasons now see the signs of approaching spring overhead in the evening skies as well as around us in woods and fields. All of the winter constellations have passed to the western sky. Taurus and Orion will be the first to dis-

appear below the western horizon followed by Canis Major, The Greater Dog, and later in the spring, Canis Minor, Auriga and Gemini.

The Big Dipper is now conspicuously in view in the evening hours, high in the northeastern sky. Cancer, the first of the spring groups, is close to the meridian, southeast of the zenith. Leo, one of the finest of the spring constellations, is climbing high into the eastern sky. The head of Hydra, The Water-snake, lies directly south of Cancer and is marked by a group of third and fourth magnitude stars. A long line of stars running in a southeasterly and easterly direction to the horizon outline part of the body of this enormous serpent which later in the spring will stretch his huge form across the entire southern heavens. The brightest star in Hydra is Alphard, now visible in the southeast, standing very much alone far from other bright stars.

CANCER (THE CRAB)



Alphard is also known as Cor Hydrae, or The Heart of the Serpent. Above the southern horizon at this time appear some of the bright stars in Argo Navis, The Ship Argo, the largest and finest constellation of the Southern Hemisphere of which we see only a very small part in our northern latitudes.

As our readers well know it is in this month that spring begins in the Northern Hemisphere as the sun crosses the equator coming northward. This year the sun will cross the equator on March 21 at 4:02 a. m., Eastern Standard Time. It is then in the constellation of Pisces, The Fishes, at the exact point of intersection of equator and ecliptic, and then, whatever the weather may seem to be, spring begins astronomically and officially, as we might say.

As for the planets, this month we will have to be up before sunrise to see most of them for Mercury alone will be in the western evening sky this month.

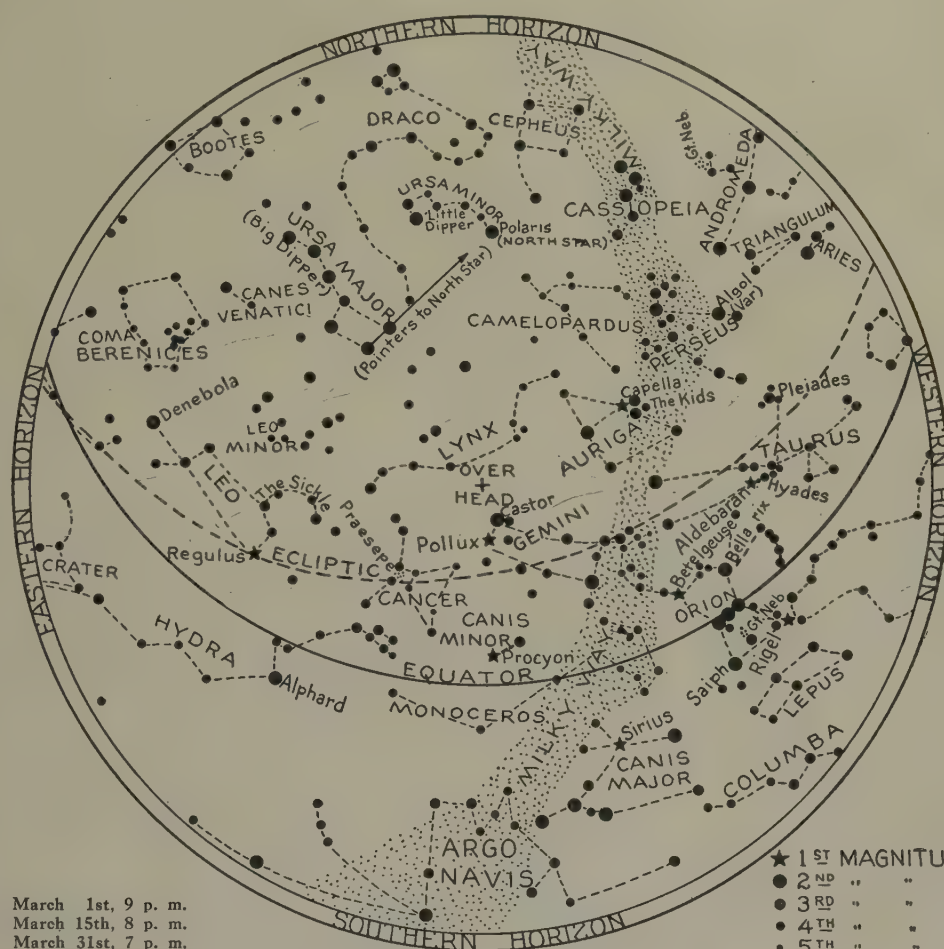
Venus, which we recall was at its greatest brilliancy in the evening sky on January 2, 36 days before conjunction with the sun, will again be at its greatest brilliancy this month, 36 days after conjunction with the sun, on March 14, only now instead of being in the western evening sky after sunset it will be found in the southeastern sky in Capricornus before sunrise, fully as beautiful as Morning Star as

it was as Evening Star ten weeks or so ago. Jupiter also will be found in the southeastern sky in Capricornus not far from Venus and on March 22 the two planets will be in conjunction, Venus passing at that time $4\frac{1}{2}$ degrees north of Jupiter. The planet Mars will be found some distance

southwest of Jupiter in Sagittarius the beginning of the month and will be easily recognized by its ruddy color. It is now increasing steadily in brightness and by the end of the month will be as bright as a star of the first magnitude. During the month it will pass eastward from Sagittarius into Capricornus.

Saturn which is the farthest westward of all the planets visible before sunrise is now rising about midnight and will be found a little to the northwest of the fiery Antares in Scorpio. It appears as a yellowish star of the first magnitude, brighter than the nearby

Antares. Mercury may possibly be picked up in the evening twilight this month on March 14 and for a few days before and after that date when it will be at its greatest distance east of the sun. On the 14th it will be about 18 degrees east and nine degrees to the north of the sun. In brightness it will surpass all stars now visible in the evening sky with the exception of Sirius but it may be a difficult feat to pick it up in the glare of the twilight at the end of March days.

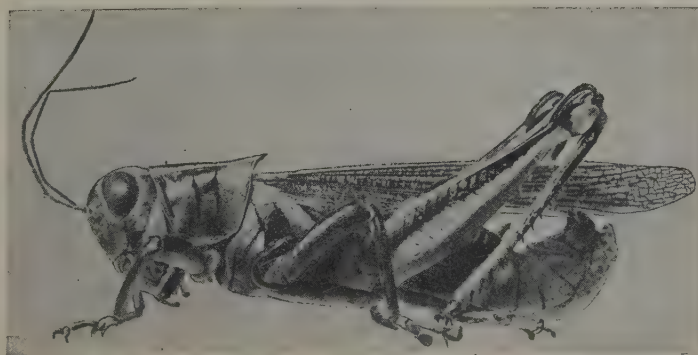


March 1st, 9 p. m.
March 15th, 8 p. m.
March 31st, 7 p. m.

To use hold over the head with top toward the North.

Grasshopper Gray

WHO, WHEN a child, has not picked up from the grass one of these strong-limbed insects, and said "Grasshopper, grasshopper, grasshopper gray, give me some molasses, and I'll let you fly away," and then having duly received from the insect's mouth the tiny drop of dark, sirupy liquid, have allowed it to go



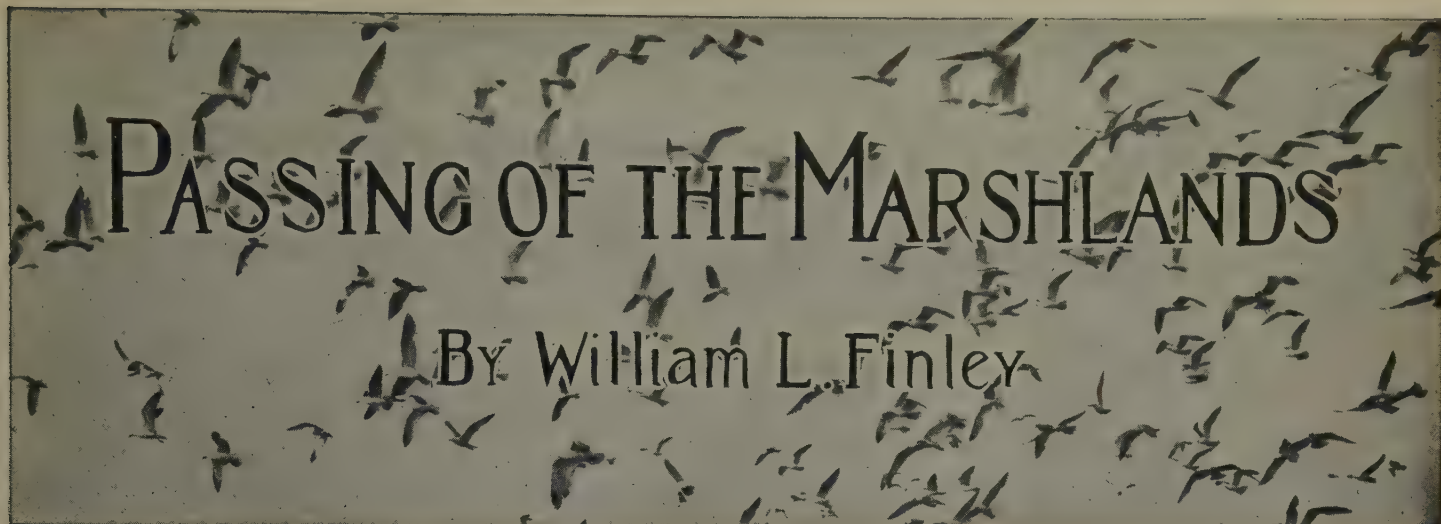
its way, believing that it had understood our speech. Or perhaps our childhood memories of the grasshopper bring visions of trudging barefoot along the narrow country roads of long ago, flushing from the brown dust one of those bright-winged flying ones, and trying to see how far we could make him travel.



PHOTOGRAPH WILLIAM L. FINLEY & H. T. BOHLMAN

A YOUNGSTER WHO FIRST SAW LIGHT IN A NEST IN THE KLAMATH MARSH

This baby avocet is one of the thousands of wild birds who have been left homeless by the draining of the waters from the tule marsh of the Lower Klamath in northern California and southern Oregon.



LOWER KLAMATH LAKE, on the border line between California and Oregon, was a natural home for wild fowl. The tules, or club rushes, covered the waters of this alkaline lake, as the firs cover the Oregon Mountains. For miles around the border and far out into the middle, the floating tule roots had spread out and each year had sent up a growth from eight to ten feet high, dying down in the fall. The decayed vegetation formed a vast peat bed, in many places several feet deep. On the floating tule islands the bird multitudes lived.

Until a few years ago Lower Klamath was like a page out of the early history of our country. It was thus we found it. Setting out down the tule-lined river in a trapper's boat, we came upon a great variety of ducks, mallards, red-heads, pin-tails, gadwalls, cinnamon teal and ruddies. In the thick grass we searched out the nests. Mothers with bright-eyed ducklings flapped ahead of the boat; anxious-eyed honkers, or Canada geese, led their goslings to safety in the tules. On little hummocks in the marsh were bitterns, rails, avocets, stilts, phalaropes, killdeers and other waders. The air was filled with a concert of western yellow-throats, song sparrows, yellow-headed and red-winged blackbirds and tule wrens. For miles around the open water of the Lower Klamath, where winding channels made endless tule islands, were colonies of California and ring-billed gulls, night herons, great blue herons, Farallone cormorants, pied-billed and eared grebes, western or swan grebes, black, Forster's and Caspian terns and white pelicans—clouds of birds, acres of water fowl, square miles of them—enough water fowl to restock the whole Pacific coast.

Years ago the states of Oregon and California deeded the lake and its marshes to the United States Government. It was set aside as a reclamation project. When Theodore Roosevelt heard that this region was being ravished by market and plume hunters, he created, in 1908, Klamath Lake Reservation.

In 1910, at the request of the Reclamation Service, the U. S. Bureau of Plant Industry established an experimental field on the Lower Klamath Basin to find out the possible agricultural value of the vast beds of tule peat.

After the experts of the Federal Government had come to the conclusion that the bed of Lower Klamath Lake was not suitable for agriculture, some of the residents in that part of the country organized the Klamath Drainage Dis-

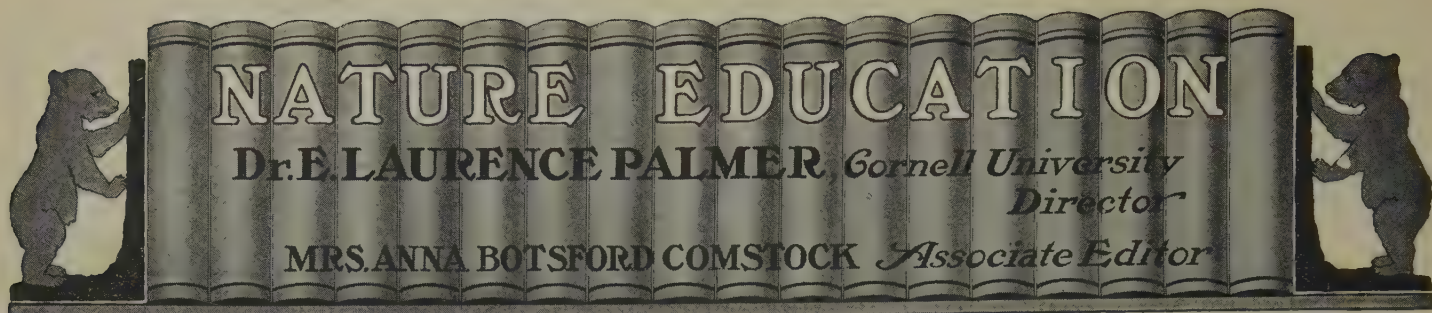
trict. The idea was to dry up Lower Klamath Lake and sell this land to farmers. The gates of the dike were closed and the wide waters of the Lower Klamath were dried up by evaporation. A provision was included in the agreement between the United States Reclamation Service and the Klamath Drainage District under which the gates might be reopened if it developed that this was the wisest thing to do.

The question at issue is whether Lower Klamath Lake is of greater value dried up and used for the planting of crops, or whether it is of more benefit to the people of the United States as a wild life sanctuary. The evidence shows that the lake should not have been dried up.

Klamath Lake Reservation was a resource worth over \$100,000 a year to the public, as a breeding place of birds; as the home of certain valuable fur-bearing animals; as a source of moisture. Some of the birds destroyed by the draining of the Lower Klamath were of immense use in keeping insect pests in check. As a direct result, of the destruction of bird life, a great outbreak of grasshoppers took place in 1923 which cost the farmers of southern Oregon and northern California \$200,000.

In return for the drying up of 85,000 acres of lake and swamp land that produced a very valuable bird crop, less than 5,000 acres have been cultivated. None of this land has produced anything exceptional from the crops that have been planted. A goodly amount of the land cultivated was above the old lake bed and would have produced the same or better crops through sub-irrigation of the soil if the water had been left in the lake, allowing the immensely valuable bird life to remain.

A compromise has now been proposed that should be satisfactory to all parties. The south end of Klamath Lake Reservation, the lowest part of the lake bed, is at present an unused waste. Enough water to cover about 20,000 acres can be let back, not interfering with any cultivation of a few thousand acres in the north and eastern border. Tules and other water plants will again take root and give a resting, feeding and breeding place for wild fowl. Around the borders other plants will grow and produce pasture for livestock. The Klamath Lake Reservation may again be a living monument to Theodore Roosevelt, who created it, if all Nature lovers will urge upon the Reclamation Service action along the lines of the proposed compromise.



Imagination in Nature Work

By E. L. PALMER

THE TOPIC above opens up plenty of opportunity for discussion. This page does not offer space sufficient to handle the problem fully but I hope by a few examples to show how imagination may be safely and profitably employed in Nature work.

That there is no imagination employed in solving Nature's secrets will be denied only by those who have never engaged in the task. The imagination is employed, however, for interpreting as logically as possible the facts which may have been gained through the exercise of the senses. The scientist might be said to differ from the Nature faker in that the scientist allows the facts to control his imagination while the Nature faker allows his imagination to overrule the facts. In teaching Nature work, some recommend that students be allowed only those opportunities which will involve the exercise of the senses. These individuals sometimes wonder why their work sooner or later becomes humdrum and monotonous. Many so-called Nature lovers apparently think that they can get the most out of Nature through reading Nature books and sitting back in a chair and enjoying imaginative experiences. The ideal may lie somewhere between these extremes.

Recently I took thirty young people on a walk through the woods. If we had wished we could have been looking for only those parts of Nature which might serve as food for birds. I have taken similar groups over the same territory with that avowed purpose and the exercise fell flat or nearly so. However, we added to that more or less formal exercise the task of drawing up a menu for an imaginary feast of the birds and the afternoon was gone before we knew it though it was bitterly cold.

We first happened to find some patches of eggs laid by a canker-worm moth. Instead of being just moth eggs they were listed on our menu as

"fresh eggs for such guests as chickadees, nuthatches and brown creepers." This made an entirely different appeal than had been the case formerly and set the crowd off in search of more food for the same or for other guests. The presence of fresh eggs even though they were not hen's eggs did not seem greatly out of place. At least they were not so much out of place as a man who sat at the breakfast table of an ocean liner with me one morning and was so "fussed" by the immaculate room and waiter that he ordered "fresh eggs and hot coffee."

It was not long before our imaginary meal for birds was increased by finding canker-worm moths crawling very slowly over the bark of the trees when disturbed. The presence of many legs suggested shrimps though, of course, the number was different and someone suggested that the canker-worm moth be served to the already considered bird guests as a salad. This started a search for additional material for the "salad course" and soon there was added some sleepy spiders, some tent-caterpillar eggs, a web-worm in winter quarters and then someone came up proudly with a promethea cocoon. This brought up the question as to whether or not the insect in this cocoon would be available as food to birds or if not why not. The ease with which it swayed out of position at the slightest tap was noticed and it was decided that while this might be a choice morsel it might not be so cheaply secured as could insects hiding in other cocoons which we found against the trunks of trees and along fences. All of this was done in an entirely different spirit than I had ever seen similar classes undertake a similar problem except for the menu-salad imaginative touch.

I might go on and tell how we added to our menu, cereals but since there were no ready prepared breakfast foods it was decided that the cereals would have to be reserved for guests

whose eating apparatus was qualified to break the weed seeds which were so abundant. This led to drawing up a list of the possible "guests" who might enjoy that part of the winter meal. We saw juncos, tree sparrows and song sparrows and decided that they would qualify in this capacity largely because of the fact that we saw them actually eating the seeds. The birds as "guests at a big winter banquet" made quite a different appeal than they had as "tree sparrows feeding upon pigweed fruits." I can think of plenty of Nature outlines which would list our observation as follows: "Observe the tree sparrow; its food, bill, feet, its habits and actions." I can safely leave it to your imagination or if you don't believe in imagination to your senses, if you will exercise them, that one procedure will "get action" and the other will not. Of course we might go to the other extreme and point out many of the foolish gushes about birds, which get nowhere. We might dress the birds up in pants and suspenders but if we did so at least some of our readers might threaten to hang us by the suspenders. There would, of course, be some satisfaction under those circumstances in knowing that the suspenders were only imaginary.

Our winter banquet so called was elaborated to include all of the winter birds which we have in this vicinity or at least all of the commoner kinds. We scratched under the snow-covered leaves like pheasants and uncovered a surprising variety of foods. The variety should have been sufficient to satisfy most dieticians. At least one of the group offered to try to figure up a "balanced meal" and this girl, of course, was taking a course in home economics. We were able to add warm meat to the menu in the form of the smaller birds which we saw. The crows and owls might under necessity be invited to the banquet for such purposes but I showed them in-

stead where a previous class had watched a screech owl eat a meadow mouse. On a previous trip we had spent an afternoon following out the runways of some meadow mice and catching the mice in our hands by forming a circle and closing in by going over the ground carefully.

There were, of course, plenty of nuts in the form of ironwood nutlets and the fruits of other trees that offered to supply the "nut course" for our banquet. Someone mentioned closing with "ices" and while there were

plenty of ices ready-made we decided for comfort's sake to omit them from our "feed."

I should appreciate suggestions from the readers of NATURE MAGAZINE as to the use of this method. I have written a number of such imaginative schemes which have proven useful to me and given them in the *Campfire Nature Guide*, published by Campfire Girls. They have their shortcomings, I know, but such use of imagination also has its place. This article is written with the hope that some recogni-

tion be made of this viewpoint in "courses in Nature Study for such-and-such-a-place." There are so many good Nature guides and handbooks on the market that any school at least in the more thickly settled parts of our country can find assistance to put such a program over safely. The danger is, of course, that we may go off completely on the imagination tangent. The question is, Should we so fear that danger that we neglect to take advantage of its good points by shunning it entirely? I believe we should not.

A Neglected Phase in Teaching Nature Study

By THURBA FIDLER

FOR THREE months we had enjoyed our wall-bird charts which I had purchased as a Christmas present for the school. The children had watched the winter birds on their way to school, and knew the habits of the downy woodpecker, the chickadee, and the white-breasted nuthatch. The flicker and the cardinal were friends, too. Then the spring birds began to come. Each morning for opening exercises the children marked on our bird calendar the date of the new arrival, and our spring study grew more interesting than the winter work had been. By the first of May I felt proud of my group of thirty citizens who knew the birds, the spring flowers, our common trees and many insect friends and foes. We owned several books and charts. We grew a wonderful flower garden. We made and stocked an aquarium. But our rule was: "Love and let alone." How I loved those days, those children and that neighborhood. I thought I was teaching Nature Study.

Then one Monday morning Fred came to me and said: "Miss Fidler, John shot a rose-breasted grosbeak yesterday."

I knew that John did not attend church on Sunday, and I knew that he frequently spent that day in the woods. But I could not believe Fred. John, my oldest boy of fifteen, who was a trusted leader at school had shot a rose-breasted grosbeak? I awaited my opportunity to see him alone, then I asked him why he had shot the bird.

He hung his head in embarrassment, then said, "It was the first one I ever saw alive, and I wanted it in my hands. When I saw it I shot before I thought."

Rose-breasted grosbeaks were rare in our neighborhood. This one was of a flock migrating northward, and had stopped in the woods. John had seen only the colored picture on our

chart previous to his experience. Therefore I did not scold or lecture. I asked myself what was wrong with my teaching. But I resolved to go into the woods with the children. If they would spend their Sundays in the woods, so would I. Accordingly when the children told me the next week end that they were going to the woods on Sunday afternoon, I asked to go along.

Loaded with our evening lunch then on Sunday we filed through the gate into the meadow. Spirits were high, the day was ideal, and life was well-worth living that bright May afternoon. Suddenly some one exclaimed, "Oh look!"

We stopped and directed our gaze in the direction of the pointing finger. There sat a mother ground squirrel gazing at us with her cheek pouches well filled with provisions. I never could tell who spoke first, or how it all happened, but suddenly down went the lunch basket; down went the string of drinking cups, the frying pan, trowels, bird guides and coats, and my well-behaved group of young citizens were yelling like mad Indians, and chasing the poor, bewildered squirrel hither and thither through the meadow grass while I stood dumbfounded, wondering how to call them off and save the victim. Finally the squirrel reached the edge of the cultivated corn field where it could run faster than the children and escaped. Back they trooped like a pack of frolicking puppies, looking half-playful, half-ashamed as they began picking up their equipment. As I was curious to understand the mental traits that led them to do it, I asked, "Children, why did you want to catch the squirrel?"

I fully expected some sturdy farmer boy to say, "Because it eats our corn," but no, the reply was, "We just wanted to see it."

Yes, that was the reason John had given when he shot the bird.

"But," I replied, "this seemed to be a mother squirrel on her way home to her family, and you might have stepped on her."

"We were careful about that. We just wanted to have her in our hands," spoke the guilty one.

The old answer. How could I meet it? I must not spoil the day by scolding. I would not, so when the group later said, "Oh, see the Mourning Cloak," and started chase, I fervently hoped all wood creatures would escape until I could get the group back safely within the four walls of the school.

That trip was a discouraging experience to me. I knew that I had failed, but why? Yes, I had taught Nature Study from the inside. Because I had loved the outdoors, I had caused the children to love my stories, the pictures and the charts. But the great curiosity about the living specimen must be satisfied by contact. I must not expect the children to jump from their plane of throbbing, tactile senses to one of grown-up understanding of life. By handling alone, could content and vividness of the outside world come. I had aroused sympathy for characters in books and for book life; now if it carried over to real life it must be because they loved real life as they felt it in actuality. Human beings have not been educated in mind alone. They developed only as their senses developed, and touch was not the least of these.

My first chance at "touch" Nature Study came a few mornings later. A first-grade boy picked up a young English sparrow that had been blown from the nest in a severe storm. He brought it to me asking, "What kind of a bird is this?"

I replied, "English sparrow." Then taking the bird from him, I put it into John's hands saying to

him, "What shall we do with it, John?"

It is an unnatural child indeed that does not thrill at the touch of the warm quivering body of a baby bird. Hated bird of birds that it was, John could not condemn it.

"Put it in a box and feed it until it can fly," he brusquely replied as he slipped it into my hands and disappeared.

Then a different kind of lesson began. As far as I was able without the children suspecting my purpose, I had each child hold the bird. That English sparrow is alive today, living its life in the manner of English sparrows simply because no one would condemn

it after it had nestled down in his hands, then opened its mouth to be fed.

In the days that followed I learned that the common expression, "Oh, let me see," really meant, "Let me feel." Then we studied Nature by feeling as well as seeing. One day a captive mole was forced to endure the clumsy caresses of a dozen hands, but as he went digging out of sight, one girl exclaimed, "Now I know why the fairy Godmother made her cape out of mole skin. It's the softest thing in the whole world, I believe."

Later my office became a museum plus menagerie. It was the most ill-

kept office in the county but it was the treasure house for twenty boys who gave me warning many times to "be careful not to step on our new specimens." I know now that the boy with a gun or sling shot shoots at a bird because it is a mark—a moving object that challenges him. I doubt if any boy kills his first bird without a feeling of remorse as he holds the warm, lifeless body in his hand. I have had children condemn the English sparrow or the mole, then turn one loose when they caught it alive. Knowledge by hand contact is keener and more satisfying than knowledge by mind alone.

Fifteen Interesting Things to Look for in March

By E. L. PALMER

IF THERE is any month in the year that seems to lack confidence in itself more than March, I don't know which one it would be. While some days it appears loyal to its old love, Winter, on others it seems to welcome the new one, Summer. Of course it is a foregone conclusion which will be the winner. The cards are stacked against winter and it hasn't a chance to win. In spite of this it manifests its persistence so unexpectedly that we cannot afford to put our winter wraps away in moth-balls or defy the coal man with ungracious words. Many plants and animals find themselves in somewhat similar situations. Unless they are hardy they cannot risk shedding the cloak of earth that has protected them for so long. Neither can they defy the sun to go back on them and refuse to keep them warm. The sun can apparently refuse to function as a furnace on the slightest provocation. The questions asked this month may very frequently hinge on the variability of the temperature. By the end of the month of course the matter seems fairly well settled.

1. Children frequently ask in this month why it is that as one leaves the earth and goes towards the sun, the source of heat, he gets into a colder atmosphere, or why it is that it is colder on mountain tops than in lowlands when the mountain tops are nearer the source of heat, the sun. If you wish to try an experiment which may set you to thinking along lines which will help you answer these questions in part at least, lean up against the wall back of a good hot stove. If you are living in an apartment or home where you have a gas heater stand the heater out a few feet from the wall and direct the heat towards the wall.

After awhile lean up against the wall and see how you like the sensation. The gas heater or the stove in this case is comparable to the sun as a source of heat. The wall is comparable to the earth. Is it more comfortable or rather warmer near the wall which is some distance from the source of heat or away from it. This of course only partly answers the question as it does not involve the variable density of the atmosphere close to the earth and away from it.

2. Do hillsides with a north exposure bear spring flowers earlier or later than those with a south exposure? In a gorge which runs east and west can you notice any difference between the kind of plants found on the south side and those found on the north side? If there is a difference would you expect the plants which grow on the south side to be naturally more northern or more southern in their distribution than the plants that grow on the north side? Watch your reasoning carefully in making this decision.

3. A child asked me if rocks can change directly into soil. March will be a splendid month for you to find the answer to this for yourself. Don't ask me or anyone else. Go to the rock. It is the authority.

4. During March many of the rivers and streams may be in flood due to the cutting off of timberlands in the uplands. While in flood these streams will leave debris as high-water marks. It will be interesting after the flood to go over a bit of ground and see if you can map out the currents of the water of the flood as shown by the direction in which the debris is left strung out.

5. During March many owls will have hatched their eggs if they have not done so before. The young will be fed and beneath the nesting tree may possibly be found the remains of some of the victims. Even before the eggs are hatched you may find records of the food of owls in "pellets" dropped by the adult birds. You may be able to identify some of the creatures eaten by skulls or bills left. The puzzle pictures which I prepared for you last year may help you in this.

6. Woodchucks, marmots and similar rodents will begin to be active again by March. Many of them go roaming over the country to some extent during this time of year before settling down to bringing up a family. Their tracks will be clearly shown in the soil or snow near their burrows. Do the tracks show claw marks like those of a dog or are the claws hidden as they are in a cat?

7. Various mammals use their claws for different purposes. Some use them for scratching purposes, some for holding or tearing purposes and others for other purposes. Do you note anything peculiar about the position of the claws on a dog's foot. Are they all in the center of the toe? Are the claws on the right toes of each foot placed similarly to the claws on the left toe of each foot? What reason can you give for the arrangement?

8. During late March the flight of birds to the north will begin to show to some purpose. Listen some quiet night when it is cloudy and some other quiet night when it is not cloudy and try to decide whether the clouds influence the height above the ground at which migrating birds may com-

monly fly. Of course you will not be liable to hear the birds flying but you should be able to hear them calling to each other as they fly.

9. If you happen to live in a valley that runs east and west try to determine, if possible, whether migrating birds follow up the valley or keep to the north across the valley.

10. A question from a child asks why it is that a snake when cut in two will go back together again. The answer of course is that it does not. The question also raises the question as to whether or not snakes should be cut in two and whether or not this generalization is applicable equally to all kinds of snakes. A milk snake and a garter snake in a box may help you answer the question for yourself.

11. The crayfish which we mentioned last month will probably lay their eggs sometime during this

month. The mother carries them around with her instead of laying them away under some rock and since you can find out for yourself whether she carries them on her back, in her mouth or elsewhere I don't care to deprive you of the joy of finding the answer for yourself.

12. Many trees will begin to flower during these months. Among them will be the maples, some of which bear fruits in a very short time after flowering and some of which are very slow about it. If possible find out which maples of your vicinity bear fruits within a month of the time they flower and which take longer than two months?

13. The first or rather the earliest flowering plants on the earth used the wind to carry the pollen which would help in the production of fertile seeds. Later some used insects to assist in this. Each year we find something of a similar sequence taking place partic-

ularly among trees. Plants that use the wind of course produce an abundance of pollen while others produce less. See if you can find any arrangement adopted by poplars that help them free the pollen into the air when it is most advantageous.

14. Cowslips or marshmarigolds may begin to show their kidney-shaped leaves in the swamps by late March. Don't destroy the plants but reach beneath and pull out a root or two. Are these roots that grow in well-watered soil abundantly or sparsely supplied with root-hairs? Can you determine a reason for your answer?

15. In some parts of the country trailing arbutus may begin to fill the air with its fragrance. In New York State it is protected by law but whether it is protected or not put up a little barrier of leaves around some that you find growing beside a frequented path and see if it does not survive vandalism longer than an unprotected plant.

Notice from School and Field

By ELIZABETH K. PEEPLES

Nature Bulletin "Nature Education in Elementary Schools," Bulletin No. 18 of the

American Nature Association, is just off the press. It gives the partial report of a committee working on Nature Education under the auspices of the American Nature Association and the direction of E. L. Palmer, of Cornell University. The report covers various rural communities, cities, training schools and problems of extension workers.

* * *

Nature Study Advanced Two events fraught with promise to the cause of Nature Study have taken place this winter.

Frank W. Ballou, President of the Department of Superintendence of the National Education Association, selected Nature Study and Elementary Science for the kindergarten and first six grades as his contribution to the work of the Commission on the Curriculum of the N. E. A. Dr. Ballou's report will appear in the fourth year book of the department of superintendence.

Liberty Hyde Bailey, author of "The Native Study Idea" and many other books, formerly dean of the New York State College of Agriculture, and a pioneer in the field of Nature Study, was elected president of the American Association for the Advancement of Science at its meeting in Kansas City, December, 1925.

American Nature Study Society Meets The American Nature Study Society at its Kansas City meeting, December, 1925, elected as its president Prof.

George R. Green, of Pennsylvania State College. The retiring president is M. R. Van Cleve, Supervisor of Nature Study, Toledo, Ohio.

The abstracted reports of the proceedings of the joint meeting of the American Nature Association and American Nature Study Society are to be printed and available to interested parties. Inquiries should be addressed to this department of NATURE MAGAZINE.

* * *

Outdoor Recreation Conference The National Conference on Outdoor Recreation, organized in 1924 at the request of President Coolidge, assembled at Washington, D. C., January 20 and 21, 1926, in its second convention. A wide range of conservation and outdoor issues were discussed.

Of marked interest to Nature Study workers is the following resolution:

"This conference goes on record as favoring the program of Nature Study, the establishment of outdoor museums, the extension of field excursions and camping trips conducted by qualified nature teachers.

The conference approves the continuance of Nature Study courses in the normal and public schools."

Annual Nature Meeting The annual meeting of the National Council Supervisors of Nature Study and Gardening,

of which Alice Jean Patterson is president, was held in the Assembly Hall, Red Cross Building, Washington, D. C., Saturday, February 20, 1926. The subject for the morning session was "The Content and Method of the Course in Nature Study for Elementary Schools." In the afternoon the election of officers was followed by addresses on "How to Secure Better Trained Teachers of Nature Study in Elementary Schools."

* * *

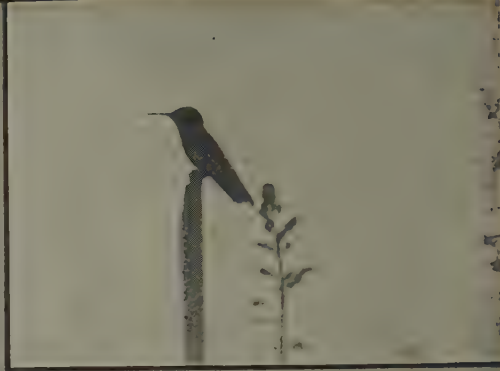
New Forestry Publication "The Forestry Primer," published by the American Tree Association, 1214 Sixteenth Street, Washington, D. C., with a foreword by Charles Lathrop Pack, President of the Association, marks the semi-centennial of the first step in forestry by the United States Government, and is intended to help the coming generations of Americans profit by the lessons of the past. The cover bears the picture of a sturdy forest monarch, dated 1876, and opposite a dead tree and stumps, 1926. The fourteen lessons which form the text tell the story of forest devastation and conservation. The pamphlet will be sent free upon request to anyone sending a stamp to cover the cost of mailing this pamphlet.



COTTON-TAIL RABBIT
Auguste Mathieu. Chicago, Ill.



WISE OLD OWL
J. Gordon Carlson. Phila., Pa.



RUBY THROAT
Martha Denny. Brookline, Mass.

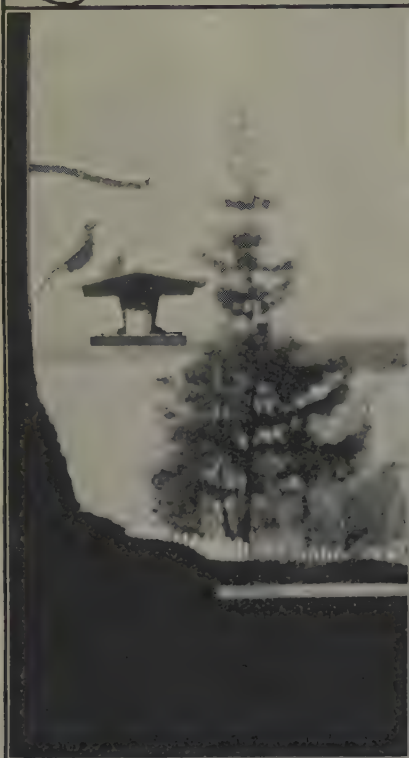
THE MARCH WINNER



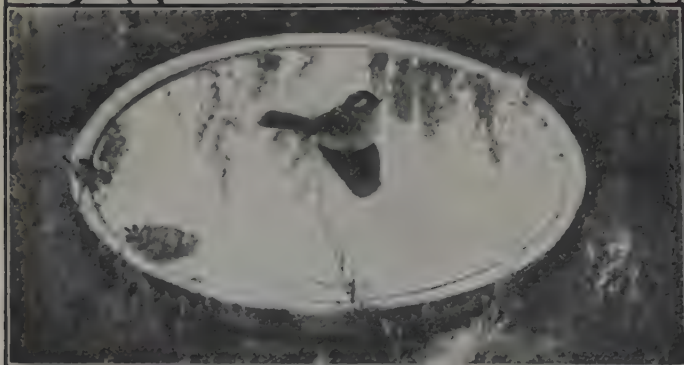
A CUB CONFERENCE
Lewis Sidebottom. Delta, Colorado.



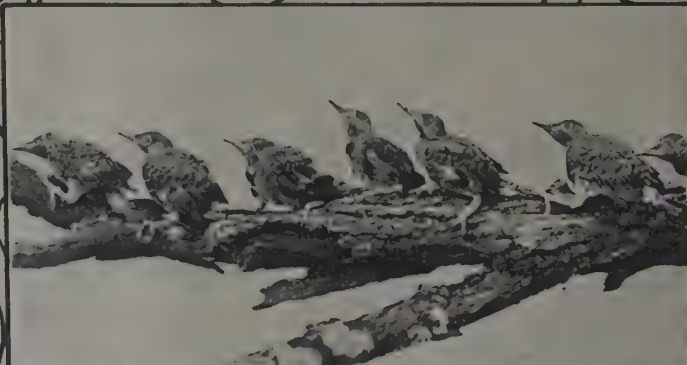
WIND-BENT KOA
Rachel C. Jordan. Honolulu, Hawaii.



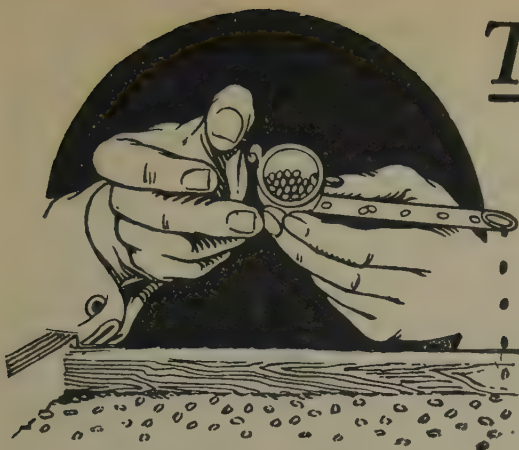
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Mrs. Gust Hensler. Anachortes, Wash.



HIS MORNING BATH
Mrs. L. N. Lindsey. Forsyth, Illinois.



BABY FLICKERS
M. L. Munson Lansing, Michigan



The NEW way to sow seeds!

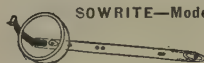
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**YOU can plant seeds
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Distributes all finer seeds. Made of tough, transparent fiberloid. Metal slide regulates flow perfectly.

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post paid

Use the Coupon!



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For all large seeds up to size of pea. Strongly made of metal, with adjustable slide.

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Use the Coupon!

ANYONE can get sure results with SOWRITE. Just fill up SOWRITE'S bowl with seeds, adjust the opening to the size of seed, then tap the bowl lightly with your finger.

EVERY SEED SCATTERS AT JUST-RIGHT INTERVALS! Seedlings spring up separately. More plants are produced per package of seeds; fewer are lost through "thinning-out." SOWRITE pays for itself in stronger, healthier plants, flowers, and vegetables.—Let SOWRITE do all your planting this spring! Fill out the coupon—Now!

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**A Permanent Garden Label
That Can't Wash Off!**



Your garden label is enclosed in "Seerite's" sturdy, clear glass cylinder, and tightly sealed with the cork-tipped wooden peg. In spite of watering can or rainstorms it stays readable always! A box of 8 "Seerites" for \$1.00 postpaid. Use the coupon!

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post paid

"BUILT-EASY" BIRD HOUSES

For Beauty and Protection

Attract lovely song birds to your garden season after season. They'll pay their way by destroying thousands of bugs, mosquitos and boring pests!



Three Styles

\$1.65

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All 3

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Model "A" and Model "C" for Jenny Wrens. Model "B" for Bluebirds, Martins or Woodpeckers

MAX SCHLING, Inc., 785 Fifth Avenue, New York City.

I enclose (check)—(money order)—(cash) for

"SOWRITE" seed sower—Model "A" (\$1.00).....Model "B" (\$1.50).....

"SEERITE" marker (\$1.00 for 8—\$11.00 per 100).....

BIRD HOUSES—Model "A".....Model "B".....Model "C".....(\$1.65 each—all 3 for \$4.50)

Above prices include all mailing costs

Name

Street..... City..... State.....

(N)

(Please print plainly)

"A Forest Processional"

By Josephine M. Dial

The Oak—our Prince of the Royal Blood—leads with head erect, and bearing aloft a torch to light the way. His banner is flung wide and flutters in the wind. His record of past victories compels respect for his prowess. He is mature and rugged, of vast experience—confident.

Close beside stands the Pine with long black hair falling in heavy braids about her slim pale shoulders. Her eyes are wide and dark, her step gentle almost to timidity. She is flecked with star-dust, and the crescent moon rides past just to light her slenderness against the dark forest background.

The Elm hard by, so rugged and dependable, withal so serious. His hands meekly at his sides, but mirth is in his heart. He could, if he only wished, clap his hands and laugh, but propriety forbids.

Our Cedar is an aristocrat of splendid bearing, having behind him a long line of distinguished ancestry. His reserve amounts almost to remoteness. One gets but faint hints of a mysterious past, which piques and provokes one to make all the advances. There has been another lady to whom no one else is comparable, and he will remain forever solitary.

Holly comes romping in, gaily singing and dancing. His cap is on one ear, an apple in his hand. He is caught thus, quickly, for he would never be still long enough to pose. He scurries away almost while you look, kicking the dead leaves noisily.

Poplar is tall and gray, looking past one into dim spaces. Around him generations have lived and loved, have played and sung. Echoes of laughter linger in his ears as he compassionately looks down on his many small brothers. But his mind soars heavenward, and he feels that he can almost unlock the gates of Paradise, so lofty he is!

There is Maple with his silver-lined cape, jaunty and smiling with a plume in his hat—the typical courtier. He is alert and ready with soft flattery. His friends are legion, for he does not know how to be unpleasant.

Willow is one who has loved and lost. Her whole being is in retrospect. The memory of those other years haunt her life, and she dwells in sorrow upon each word—each look. She is like a shadow stealing across the brow—a hush in the chamber where death is. She sits by the bank where his boat cast anchor on that last home-coming. Hour by hour she is seen softly weeping.

Midsummer Garden Joys Come from Waterlilies Selected This Month

Hardy and Tender varieties, Day and Night bloomers, add so much to the charm of a garden that they are well-nigh indispensable.

Waterlilies can be had just as easily as any other flowers. All you need is a tub, a pool, or a small pond. From my booklet select now the varieties you like, and I will send them at the proper planting time.

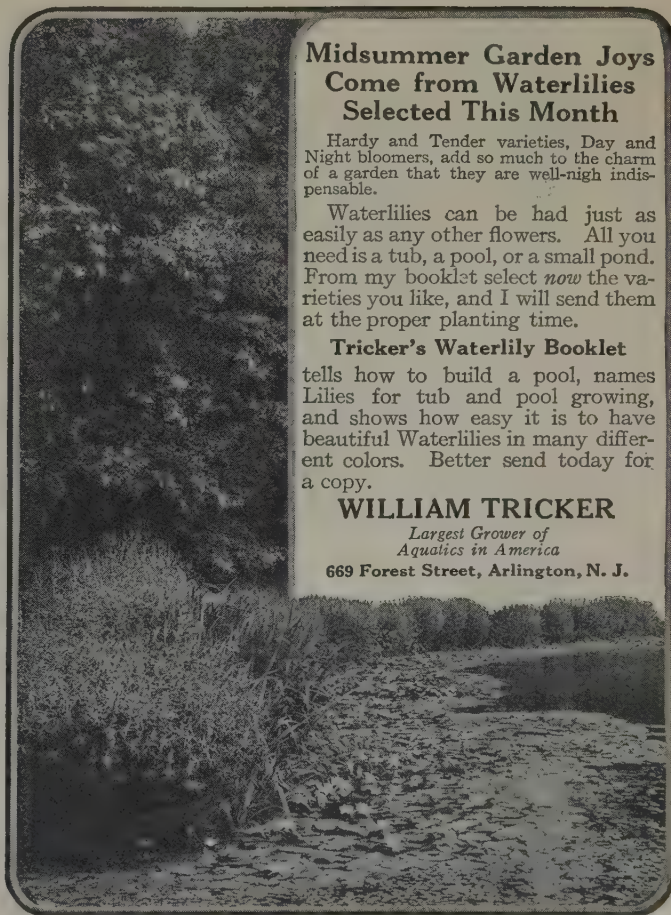
Tricker's Waterlily Booklet

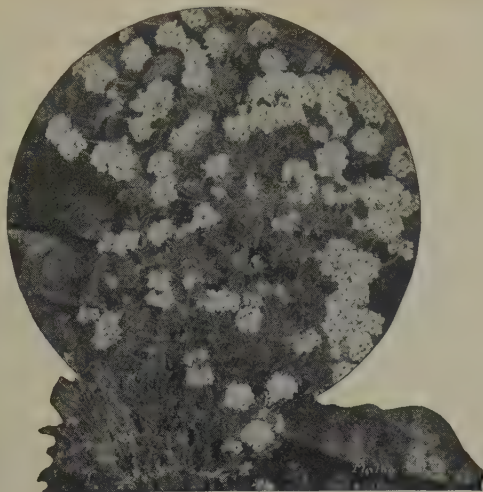
tells how to build a pool, names Lilies for tub and pool growing, and shows how easy it is to have beautiful Waterlilies in many different colors. Better send today for a copy.

WILLIAM TRICKER

Largest Grower of
Aquatics in America

669 Forest Street, Arlington, N. J.





Rock Gardening

The fashionable and fascinating Gardening Hobby of today

Every garden, no matter how small, affords a position for a colony of *Rock Plants*—a delightful class that is worthy of careful study, and if used in quantity, provide a new picture to delight the eye, each month from March until November.

Our new catalog of *Rock Plants* offers a very carefully compiled list of these extremely interesting little plants, both bulbous and herbaceous, and is probably the most comprehensive

catalog devoted entirely to Rock Plants

ever issued in this country. *Dwarf Evergreen and Flowering Shrubs*, suitable for use in *Rock Garden* design, are included.

Many illustrations (from actual photographs) of some unusually beautiful and rare species are featured, while brief instructions for selecting the situation and construction of a *Rock Garden* are also given.

We feel sure that this book will introduce many new and rare species to those who are already interested in *Rock Gardening*, while it should prove extremely helpful and enticing to the beginner. It will be mailed FREE to all who request a copy.

W. E. MARSHALL & CO., Inc.

152 West 23rd Street

New York City



Many Hear Finley

Lecturing in many cities in the eastern part of our country this winter, William L. Finley, Director of Wild Life Conservation of the American Nature Association, has carried the message of Nature to more than 10,000 people. Of the 1,600 Washington members of the Association, a large proportion attended the lecture by Mr. Finley given in the capital in January. Mr. Finley's remarkable wild life films have awakened widespread comment and enthusiastic response.

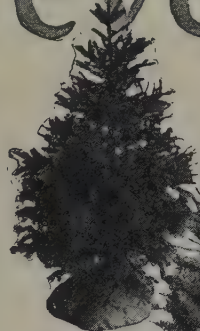
Rolled Oats—a Diet

"If there is any one food that all wild creatures, east or west, enjoy, it is rolled oats." This statement was made by R. Bruce Horsfall in his article on birds in the winter months in the January issue. This intelligence has aroused some surprised comment. He states in answer to this that it seems generally little realized that this is a fact, and that bird lovers who wish to attract their feathered friends to their free lunches will find rolled oats a particular attraction. Mr. Horsfall has used this fare on his bird feeding tables for years and passes the word on to others.

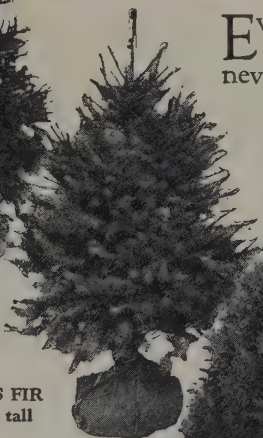
Swans Protected

The ten-year close season during which swans may not be hunted anywhere in the United States expires December 7, 1926. This restriction was made under the provisions of Article three of the treaty between the United States and Great Britain enacted for the protection of birds migrating between the United States and Canada. The Biological Survey of the United States Department of Agriculture, which makes this announcement, says that the Federal law to enforce the treaty also prohibits the taking of migratory birds except as permitted by regulations thereunder promulgated by the President. Therefore, even with the end of the ten-year close season, it will still be unlawful to kill these birds at any time, until the migratory-bird treaty act regulations are amended to allow the "killing of swans" during a stated open season. An exception will be made for scientific purposes, however, under permit of the Secretary of Agriculture.

evergreens



WHITE SPRUCE
1½ to 2 ft. tall



DOUGLAS FIR
2 to 2½ ft. tall



AMERICAN ARBORVITAE
2½ to 3 ft. tall



DWARF ARBORVITAE
1 to 1½ ft. tall

EVERGREENS at the doorstep on the lawn in the garden never were they more popular. Here are four beautiful specimens selected from the Nursery's best. They are hardy, healthy, full foliated plants, fresh dug and shipped promptly on receipt of order. You receive them carefully crated, each with its massive root system balled in native loam tied in burlap.

4 for only \$10.00

This special group price saves you 25% of the cost of the same beautiful trees purchased singly. Use the coupon.

Send for the new Little Tree Farms Book—"America's Leading Landscaping Guide and Nursery Catalog."



Little Tree Farms
AMERICAN FORESTRY COMPANY



FRAMINGHAM CENTRE, MASSACHUSETTS

☐ Send me the 4 evergreens as pictured above. I enclose \$10 (check) (money order).

☐ Send me the 1926 Little Tree Farms Year Book.

(Only 2 of the above combinations per customer at this special price)

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For Nature Poets

To stimulate interest in the study of Nature, the conservation of our valuable native flora and fauna and the preservation of important scenic areas, the Outdoor Nature Club of Houston, Texas, offers prizes of \$15 and \$10 for the two best Nature poems hitherto unpublished, not more than twenty-four lines long and submitted by residents of Texas, Louisiana, Arkansas, Oklahoma and New Mexico. The poems become the property of the club but the authors will be given credit when and if published. The contest closes May 1 and the winners will be announced on or before June 1. All manuscripts should be addressed to Mrs. A. J. James, 3003 Travis St., Houston, Texas. The club hopes at some future time to sponsor a similar contest of national scope, but feels for the present that it should limit the reach of the contest geographically.

Yellowstone Martens

Martens have been regular and intimate visitors around the cabin of the caretaker at Camp Roosevelt in the Yellowstone National Park. E. J. Sawyer, Park Naturalist, reports. Mr. Sawyer adds: "I know of no animal which surpasses the marten for beauty and grace, as he explores among the dark conifer branches. Peculiarly thrilling and pleasing is the spectacle of one of these usually timid animals nonchalantly exhibiting his valuable fur coat so close to the popping eyes of the admiring human observer. It seems as though he were actually bent on tempting the avarice of man. As he crouches on an overhead branch and watches you, the marten has the appearance of a little brown tree-going fox, and his expression is one of concentrated and enquiring interest."

Maglys Tune in

Someone has to look after our National Parks in the winter, and Ranger and Mrs. Magly do this out in the Sequoia National Park. Despite snows that may pack the roadways and rains that make them rivers of mud, these custodians of our playgrounds are keeping in touch with the world that lies below the Sierra Nevadas. They are attending operas, listening to lectures and hotel dance orchestras, because in appreciation of little extra touches of hospitality visitors to the park from Lindsay packed a super-heterodyne radio set up the General's Highway a few days before Christmas.



ENGLISH WALNUTS

ROCHESTER
GROWN

**Plant some English Walnut Trees this Spring—
Order now!**

Our trees produce some wonderful nuts here at Rochester

Here in the North, thousands of English Walnut trees are thriving and bearing delicious nuts—you are safe in planting our hardy northern grown trees in localities *where the winter temperatures are not too severe for peach trees*—in almost every locality, north, east, south or west, you will find bearing English Walnut trees—wherever peach trees will grow, our hardy English Walnut trees will succeed.

We offer small trees as low as \$1.00 each, but *send for our beautiful catalog*, which describes the different varieties, the different sizes with prices, also a multitude of other *hardy nut trees, fruit and ornamental trees, roses, shrubs, evergreens, hedge plants, etc.*, for while we have the largest assortment, and the largest stock of northern grown nut trees in America, we are also growers and have been for more than half a century, of a general line of hardy, dependable nursery stock.

If you intend to plant an orchard—If you intend to beautify your grounds—no matter how much or how little you intend to plant, start with "Glenwood Grown" trees. Send for that catalog "N" today—it's our only salesman.

GLEN BROS., Inc., Glenwood Nursery
Established 1866, Rochester, N. Y.

Wohlert's flowering Trees



Chinese Flowering Crab
Japanese Roseflowering Cherry, etcetera
America's Finest Collection

EARLY in the spring these Oriental trees burst into glorious bloom; a riot of delicate color converts lawns, groups of shrubbery and gardens into veritable Paradises. Order these Oriental Flowering Crabs from America's Finest Collection.

\$50 Assortment [Trees 4 to 5 feet high]

1 Crab Sargentii, dwarf, white, red fruit.....	\$5.00
1 Crab Baccata, single, white, fragrant.....	4.00
1 Crab Floribunda, sgl. pink, early.....	3.50
1 Crab Arnoldiana, semi-dbl. pink.....	3.50
1 Crab Atrosanguinea, single red.....	5.00
1 Crab Bechtels, dbl. pink, fragrant.....	6.00
1 Crab Niederswetzkyana, purple fl. and fol.....	4.00
1 Crab Spectabilis, double pink.....	5.00
1 Jap. Cherry, Weeping, single pink.....	6.00
1 Jap. Rosefl. Cherry, Kofugen, dbl. red.....	6.00
1 Jap. Rosefl. Cherry, Naden, dbl. pink.....	6.00
Special for March, \$50.00.....	\$54.00

\$25 Assortment [Trees 2 to 3 feet high]

1 Crab Floribunda Purpurea, purple.....	\$1.75
1 Crab Atrosanguinea Ming Shing, sgl. red.....	2.00
1 Crab Arnoldiana, semi-dbl. pink.....	2.25
1 Crab Baccata, sgl. white, fragrant.....	2.00
1 Crab Bechtels, dbl. pink, fragrant.....	4.00
1 Crab Scheideckeri, dbl. pink.....	2.00
1 Crab Sargentii, dwf. white, red fruit.....	3.00
1 Crab Ioensis, sgl. pink, fragrant.....	2.00
1 Crab Floribunda, sgl. pink, early.....	2.00
1 Japanese Weeping Cherry, sgl. pink.....	4.00
	\$25.00
Same asst. as above, trees 3 to 4 ft. high.....	\$34.75

\$15 Assortment [Trees 2 to 3 feet high]

1 Crab Niederswetzkyana, prpl. fol. and fls.....	\$2.00
1 Crab Atrosanguinea Ming Shing, sgl. red.....	2.00
1 Crab Parkmani, semi-double, pink, dwf.....	3.00
1 Crab Prunifolia Rinki, Chinese Apple.....	1.50
1 Crab Scheideckeri, dbl. pink.....	2.00
1 Crab Eleyi, purple to red—new.....	2.50
1 Crab Ioensis, sgl. pink, fragrant.....	2.00
	\$15.00
Same asst. as above, trees 3 to 4 ft. high.....	\$21.50

Trees may be ordered singly or in any combinations at above prices

If larger trees are wanted, send for catalog of every variety of Oriental flowering trees obtainable in America

A. E. WOHLERT • "The Garden Nurseries"

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Burpee's GOLDEN BANTAM Sweet Corn

The richest and sweetest of all sweet corn, with a distinctive, buttery flavor; an especially handy size to eat from the cob, with deep, exceptionally meaty kernels. An early variety that will give you plenty of fine tasty corn on the cob. Burpee's "Golden Bantam" is universally conceded to be the most popular sweet corn in America.

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will be mailed you FREE on request. It is a book of 224 pages, packed with pictures and information of interest to garden lovers . . . the most popular publication of the kind in the world.

Write for Burpee's Annual and Free Sample of Seeds

To each person sending us this month the coupon below, we will include with the book an order blank good for a choice of any regular 10c packet, as a free sample.



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Seed Growers Philadelphia

Send me Burpee's Annual with Order Sheet, good for a free 10c packet of Burpee's Seeds. 12-3

Name _____

R. D. or St. _____

P.O. _____ State _____

Forest Soldiers

There is an interesting and valuable viewpoint contained in a series of forestry educational paragraphs being sent out by the Pine Institute of America, Inc., under the name of its president, O. H. L. Wernicke. The series is entitled Pointed Pine Paragraphs, and emphasizes the importance of wild life to the forest, the vital necessity of the forests for wild life, and the supreme importance of both to humankind. We quote one of these little features:

"The forests harbor birds, little lizards, and toads, which keep the insect pests from getting too strong for us. Scientists say that if all the birds were killed, insects would become so numerous that human life would be starved off the earth in seven years!

"Birds, lizards, toads, etc., are our friends. More than that, they are our soldiers, the army fighting the grimest war of mankind. There is no truce in this war, no surrender, no armistice, no peace, no quarter. It is a war in which defeat means the death of the human race. A dead bird is a dead soldier—a dead friend.

"The forests are the camps of our soldiers. Tear down their camps and you have betrayed the human race to the enemy."

The White Pelican

"Removal of legal protection from pelicans and cormorants by the last legislature, on the ground that they are inimical to the interests of fishermen, is arousing bird lovers throughout the state," says the bulletin of the Natural History Museum at San Diego, California. "It appears that only the white pelican of our inland waters has been singled out for persecution, its brown cousin of the ocean being still protected by law. On the other hand there are three kinds of cormorants and all are apparently blacklisted. The Natural History Society's Conservation Committee has received reports of white pelicans slaughtered merely as 'targets' by duck hunters, and their bodies left to rot. A correspondent writes us from Los Angeles: 'The pelican's food has been well studied by scientists and found to consist chiefly of useless fish. If the cormorant takes edible fish, what of it? He has been eating it for thousands of years and we still have plenty left. Next the "sportsmen" will put gulls on the unprotected list and our beaches will be birdless! We surely must get busy and work hard. Will you attend to San Diego organizations?' The Conservation Committee will see to it that the next legislature has a chance to hear the opinion of the people at large, as against the minority voice of the fishermen."

BUIST'S SEEDS

Be sure to get a copy of our big, new 1926 Garden Guide before you order seeds for this season. Our Seed Book contains 136 pages, is profusely illustrated and offers only the best and most successful varieties at prices that will interest you.



Also a Coupon worth 25c on Seed Purchases of \$1 or more

Send for your Free Copy Today
Free Flower Seeds with orders of 50c and over

ROBERT BUIST COMPANY
Seedsmen for 98 years
Department S Philadelphia, Pa.

Just Out! 2 Brand New Strawberries

Write for our FREE Berry Book and learn all about these wonderful new Strawberries. The earliest and latest varieties on record. This book pictures these and many other prize winning Strawberries in natural colors. Tells how to grow Strawberries, Raspberries, Blackberries and Grapes the "Kellogg Way." Many make \$500 to \$1200 per acre, others \$100 to \$300 from a small garden. This Berry Book is FREE. Write for it.

R. M. KELLOGG CO.
Box 6225
Three Rivers, Mich. [25]

Write for FREE BOOK

Earliest Tomato



is Jung's Wayhead. Big red fruit ripe as early as July 4th. Nothing earlier to be had anywhere. As a special offer will send you a pkt. of this Tomato and pkt. of Cabbage, Carrots, Cucumber, Lettuce, Onion, Radish, Parsnip, Superb Asters and Everlasting Flowers, all 10 pkts. for 10c. Coupon worth 10c free with each order. Money back if not satisfied. Catalog of Seed Bargains FREE. Send today.

J. W. JUNG SEED CO., Sta. 12, RANDOLPH, WIS.

GOOD SEEDS

Grown From Select Stock—None Better—56 years selling good seeds to satisfied customers. Prices below all others. Extra lot free in all orders I fill. Big free catalogue has over 700 pictures of vegetables and flowers. Send your and neighbors' addresses.

R. H. SHUMWAY, Rockford, Ill.

Ant Versus Worm

The story of the battle between the spider and the mouse, in which the former came out victorious, excited wide comment. Another reader sends us another thrilling story direct from the ringside where a fight to the finish between an ant and a worm had taken place.

"Resting, seated on a stump, I glanced down to the ground. There came a large, bright-green worm, about four inches long and a little larger around than a lead pencil, crawling slowly by an old decayed log. Suddenly there appeared a large black ant, about an inch long, seemingly all legs and feelers, and with a body no larger than a small white bean and a head only as big as a small green pea. The ant and the worm met face to face and the battle was on.

"No more fierce battle ever raged than that which followed. The ant charged with his feelers straight. Into the worm went the ant's jaws. The worm curled into a ball with seeming agony. The ant drew back a few inches and the worm righted itself on its several green peg-legs, facing its foe. Again the ant charged furiously, sinking its jaws into the worm, which lashed itself, curled up and then faced the smaller battler. It had no means of defense against the repeated charges of the ant.

"The worm grew weaker and weaker, but was game. The ant seemed to delight in the battle, seeming to feel that the contest was won. It charged from every side, not bothering to draw back between blows. Finally the worm lay motionless on its side. The ant departed.

"Then for the first time in several moments I realized where I was. I had scarcely breathed during the entire battle. Still I wondered the why of it. I had not long to wait, for the ant returned with several others, quite equal in size. They all inspected the dead worm. Then they formed a circle and went around and around the worm like Indians in a war dance. Then they all left without disturbing the ant. It was but a moment or two, however, when at least two dozen ants of all sizes returned. They climbed up on the worm and surrounded it. I thought there would be a great feast, but I was wrong. Presently I saw the worm move. It was being pushed and dragged slowly away and finally, with its escort of ants, disappeared beneath the log to grace some ant banquet table."

GIVE NATURE MAGAZINE
as a Birthday Present

A Garden Full of Gladioli



The Gladiolus is one of the most satisfactory flowers grown—it is as easy to grow as the potato. Every family can enjoy this grand flower. They bloom from July to frost if you plant a few bulbs each month from April to July.

Special \$2.00 Offer

For Two Dollars we will send 50 Bulbs of our Grand Prize Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Special \$6.00 Offer

100 Choice Named Varieties (Catalog Price \$6.00)

For those who plan their Garden according to a color scheme, we offer 10 Bulbs each of the following 10 choice varieties:

Evelyn Kirtland, Rosy Pink; Flora, Finest chrome-yellow; Le Marchal Foch, Fine salmon-pink; Mrs. Frances King, Vermilion; Mrs. Frank Pendleton, Deep salmon; Orange Glory, Rosy orange; Panama, Rose-pink; Peace, Splendid white; Schwaben, Finest canary-yellow; War, Deep ox-blood red.

Order Your Bulbs Now, so as to have them to plant when you begin making your garden.

Simple cultural directions in each package

Mention this advertisement and send Check, Money Order, Cash or Stamps, and secure either one, or both, of these splendid collections, sent prepaid to any point in the U. S. east of the Mississippi. For points West and Canada add 25c for the \$2.00 collection or 50c for the \$6.00 collection.

Our 1926 Spring Seed Annual sent on request

Stumpp & Walter Co

30-32 Barclay St.

New York City



Strong Rooted, 2- or 3-yr.-old Bushes, nearly 2 ft. High
TO ADD QUICKLY 1000 CUSTOMERS

We make this remarkable SPECIAL OFFER on the finest, fragrant varieties

COLUMBIA—newest big pink; GOLDEN OPHELIA—rich yellow; PREMIER—rose pink; DOUBLE WHITE KILLARNEY—ivory white; AMERICAN LEGION—fragrant new deep red.

FREE 1926 GUIDE

To Roses, Evergreens, Fruit, Grape Vines, Berry Plants, etc., in colors.

400 Acres in Nurseries and Fruit Trees.

Every bush has already bloomed!

GUARANTEED to Grow and Bloom for You or Money Back

Pick regular, long-stemmed, hothouse roses all summer and till frost comes.

ACT NOW

Low price holds good only till limited number of collections is sold. Send \$1.95 today—all five bushes

mailed postpaid to your home when planting season opens. If beyond the Mississippi River, add 10c.

COLLINS NURSERIES

ARTHUR J. COLLINS SONS, Inc.
Box 96, Moorestown, N. J.

Bloom Despite Snow

For several years we have bought your fine \$1.95 Rose Collection. The bushes are all strong, the blooms beautiful. The white Killarney has bloomed with the ground covered deep with snow. We brought it in and enjoyed its fragrance for days.

—W. H. G. Phila.

Deal Direct with a Reliable Grower

WE GROW OUR OWN TREES. We have no agents; our catalog is our only salesman. We can save you the agent's commission. We do a strictly cash business; you do not pay for others' bad debts. For these reasons we are able to quote "Prices as Low as Consistent with Highest Quality."

EVERGREENS

77 Varieties—1 ft. to 20 ft.

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Dingee roses are grown on their own roots—known as the best for 76 years. Send for our "New Guide to Rose Culture" for 1926—it's free. It isn't a catalog—it's a practical work on rose growing. Profusely illustrated. Offers 500 Roses and other plants, bulbs and seeds, and tells how to grow them. Safe delivery guaranteed. 70 greenhouses.

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Perennial plants from Huntington's seeds. We grow, gather, clean and import, and know perennial seeds better than any other concern in the trade. If it is a good perennial we have it. Free list.

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A Coincidence

The following observations from Mr. C. S. W. Barwell of Vancouver, B. C., comes somewhat as a coincidence. After reading the article by Mr. Macnamara in the December issue on Insects of the Snow, Mr. Barwell wrote in his observation of another snow phenomenon, and, interestingly, an article on that very thing was in process of preparation for this issue.

"In 1897," Mr. Barwell writes, "I was crossing the Chilkoot Pass on my way to the Klondike. I was warned by numbers of miners against the danger of snow blindness, but as I had done a great deal of traveling in the northwest territories on snow-covered prairies and had never been bothered with my eyes, even in March, when the surface snow is highly crystallized and the glare very strong, I paid very little attention to these warnings. On my way up the last pitch of the trail one day an Indian packer in my employ pointed to a patch of pinkish snow and said, 'Him snowblind.' Not being able to talk his language the conversation stopped there. That night, back in camp, I asked a squaw man who lived with the Chilcoots what the Indian meant. He told me that the pinkish color was due to a tiny red animalculae, that appeared in the snow when it was soft, and that if they got into your eyes it would cause snow blindness. He also said that there was usually a squaw in a tribe with sharp enough eyes to see the tiny animals and enough skill to remove them from the eyes, thus curing the malady.

"I crossed the pass for the last time a few days later. There was no sun and had been none for about three days previously. It was windy with slight snow and drift. That night I was for the first and last time in my life genuinely snowblind, the condition lasting for three days."

The Common Barberry

We all have seen posted here and there in railroad stations and other public places folders offering rewards for this or that criminal and displaying pictures of the fugitive. The United States Department of Agriculture has just issued such a circular as Department Circular 356. The criminal this time is the common barberry. The folder gives pictures showing how to identify it, capture it and do away with it. The reward is not in cash but in the preservation of the wheat crop, which is attacked by the black stem rust that is traced to this barberry criminal.



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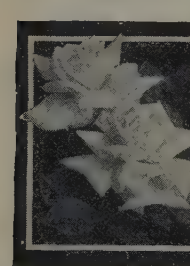
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A Word from India

E. R. Taylor, a member in Marietta, Ohio, sends in the following excerpt from a letter from a friend, Miss Elizabeth D. Galbreath, a missionary at Etah, Uniter Province, India. It gives us a view of Nature for away.

"The other day," Miss Galbreath writes, "a whole tribe of monkeys came into our garden. A dog was sent after them and all escaped but one poor little fellow who fell prey to the dog. The trees in front of our house were full of monkeys and as soon as the news reached them they all came into our yard to fight. They are afraid of man, but they went after that dog and nearly killed him before anything could be done. Finally one of the servants picked up the dead baby and threw it out near enough to the monkeys for them to get it. The mother came and smelled her baby and then sat back a ways and cried. She came again and again to look at it and then picked it up and took it over under the bushes, and there sat by it. Three vultures soon came, which aroused the monkeys to fight them off. The mother, for fear one might fly down and grab the corpse, sat on it until they had all gone away. There she sat for quite awhile, crying all the time. Then she picked up the little body and carried it off, where we do not know."

Swan Noses Counted

The census takers have been after the swans. Experts of the United States Biological Survey have recently completed a count of swans which concentrate in winter quarters on Chesapeake Bay, Maryland; Back Bay, Virginia; and Currituck Sound, North Carolina, and adjacent waters. A census revealed a total of 14,567, and probably the number was in excess of 15,000. Even on the basis of this census, little can be said as to the increase or decrease. The ten years of protection given swans will expire in December, 1926, and during this period they have become much bolder in the presence of man. The protection will obtain even after the end of the decade until regulations are promulgated by the President permitting hunting of these birds. Some sportsmen have complained that the swans consume large quantities of duck food, but the survey shows that there have been no serious inroads made into this supply. It remains to be seen whether the confidence in man gained by the swans during ten years of protection will be imposed upon by lifting the barrier and letting shooting begin again. The swan is a superb species of wild life worthy of protection and not extinction.

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Late planted peas are almost always a failure because midsummer heat and lack of moisture invites rapid leaf growth without providing an adequate root system to maintain it. Avoid this difficulty by planting all your peas early.

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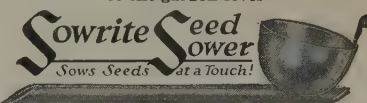
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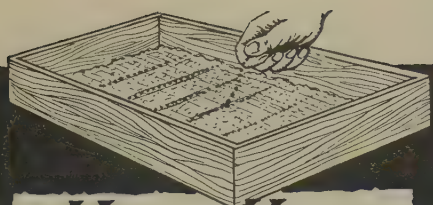
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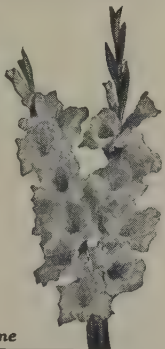
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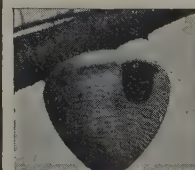
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Children's Museum

For those who think that broad expanses of open country are necessary for Nature work and knowledge we have the answer in the splendid accomplishments of the Brooklyn Children's Museum. The photograph of the simple habitat group used in illustration of the article, "Getting the Habitat Habit," in the January issue of NATURE MAGAZINE is one of the groups at the museum. It is a part of the Franklin W. Hopper Memorial Loan Collection. A periodical known as "Children's Museum News" carries the story of the work being done in illustration and text, and the word of Nature is being ably spread by Raymond C. Deck, Curator of Natural History.

Satin Moth Active

The presence of the satin moth in the State of Washington and its spread to the States of Maine and Rhode Island, and to new territory in New Hampshire and Massachusetts has led the Secretary of Agriculture to extend the area held under Federal quarantine. Scouting work by the Federal Horticultural Board this year found the pest established in certain areas in Maine, Rhode Island, and Washington and in additional localities in the states previously quarantined on account of this pest. This quarantine applies only to poplar and willow trees or parts thereof capable of propagation. On account of the extreme difficulty of detecting the inconspicuous webs in which the caterpillars hibernate, it is necessary to place an embargo against the movement of these trees from the quarantined areas.

What's in a Name?

When its particular attractiveness at this season brought up the question, Curator Graves of the Brooklyn Botanic Garden was asked by the *New York Times* the wherefore of the name "matrimony vine." He replied that "it has been suggested that because both flowers and fruit may be found on the plant at the same time, it is a desirable ornamental for weddings. Plants have been christened for slenderer reasons. Also, the leafy branches, dotted with showy flowers and fruits, reaching over until they touch the ground, are certainly decorative. Another reason brought forward for the name, but just as slender a reason, is the fact that the flowers, and consequently the fruits, also, are often borne in twos at the joints of the stem. Nor is the plant actually a vine, but a shrub, with drooping and trailing branches, growing so thickly and close together as to produce a curtainlike effect."



SPRINGTIME—AND RUSTIC HICKORY

When the ice starts goin' out of lake an' river—when the pussy willers start a-noddin' 'round the marshes—that's the time you start thinkin' of the fishin' and the trampin'. But what about the sittin' and the eatin' and the sleepin' in the ole summer cottage, when the fishin' day is done?

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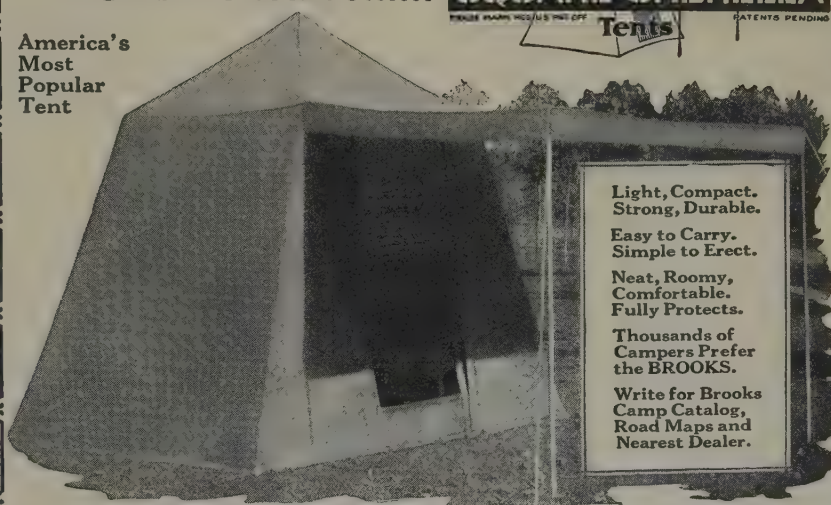
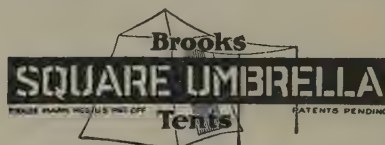
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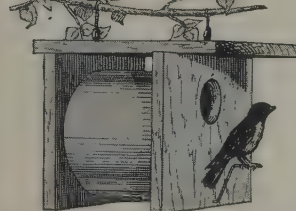
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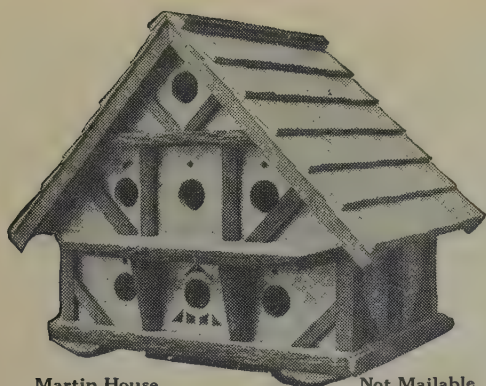
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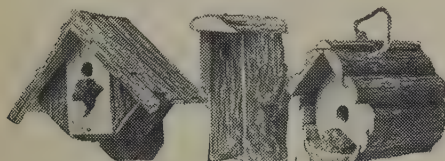
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No. 62 Bluebird No. 60 Robin No. 60 Wren

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Toms River P. O., N. J.

Do Ouzels Swim?

By HARRIET WILLIAMS MYERS

The sight of a water ouzel, or American dipper, never fails to bring a thrill to the bird lover, no matter how often this charming little western bird may be seen. Its habit of diving into the swiftest current, disappearing from sight in the water, and suddenly flying directly up out of it some distance from where it went in, and some seconds afterwards, as well, is familiar to all bird students.

On the sixth of November, 1925, I saw a most unusual performance by one of these birds, and am wondering if anyone else has had a similar experience. It was about four p. m. at Hot Springs, Tulare Co., California. Hot Springs is a summer resort and has a large plunge of warm water which is constantly used throughout the summer months, but by November is seldom used by humans. Every afternoon, at this time of year, and about four o'clock, one solitary water ouzel makes his appearance on this plunge. The day I watched him, he came flying from the stream below, and paused on the edge of the plunge where the water was ten feet deep. Then he jumped in and began "swimming" on the smooth, quiet surface. He moved rapidly about and all the time picked something from the water. As we watched he came over into the center of the plunge and not far below us, still industriously feeding on "something." Seemingly, he did not move a muscle in his progress except when he was in a hurry, then we could see him move his wings rapidly, which took him forward in a sudden spurt. He only did this a few times, and otherwise swam about as would any member of the duck tribe. He must have been using his feet as propellers, although we could not see them, and he certainly made good progress, despite the fact that his feet are not webbed. He also dived into the deepest part of the plunge, one time going in at the ten-foot depth, remaining concealed for what seemed a long time, then coming up at the lower and shallower part of the big pool. At a two-foot depth we saw him dive down onto the bottom and remain there a moment.

Every day this one bird comes and goes through these antics. Just why he is always alone when a pair of them have for years nested a short distance away, is hard to understand.

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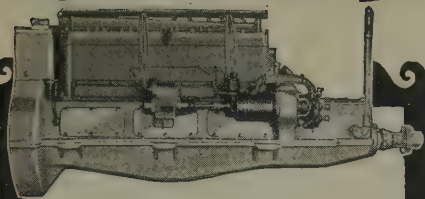


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What Is Mahogany

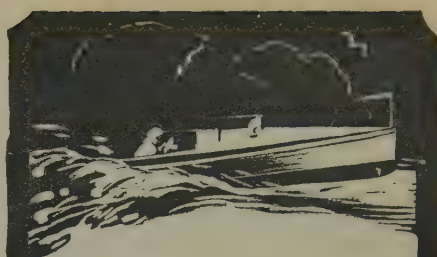
The ordinary buyer of mahogany furniture is uncertain in his identification of the wood and even less informed as to the source and nature of what is “genuine” mahogany. Recent trade disputes have increased his confusion. According to the Forest Products Laboratory of the U. S. Forest Service mahogany is a name which has been applied since the middle of the sixteenth century to a certain kind of wood coming from tropical America. From that time forward the wood has been noted for its rich brown color, deepening with age, beautiful figure, little shrinkage, comparative freedom from warping, easy working quality with sufficient hardness and strength to withstand ordinary usage as furniture, and relative freedom from trouble in finishing. The botanical name *Swietenia* was later given to the tree from which mahogany lumber is obtained.

It is customary to apply a common generic name to all species of a botanical genus; hence all species of *Swietenia*, of which five are known at present, are entitled to the name mahogany. These species, all of which grow in tropical America, are not as yet differentiated by specific common names, as in the case of our pines, maples, oaks, and other common species. Consequently when one orders true mahogany he may receive any one of these species, although some of them are less abundant like the others and therefore not so likely to appear in shipments. Manufacturers sometimes show preference for mahogany lumber from certain regions by specifying “Mexican” mahogany, “Honduras” mahogany, “Cuban” mahogany, etc.

After the true mahogany had become well established in trade, other kinds of lumber from the American tropics and other parts of the globe were put on the market as “mahogany,” usually with a qualifying term as “East Indian” mahogany, “Philippine” mahogany, “African” mahogany, etc., including, all told, over 60 different kinds of wood. Whether or not such lumber is entitled to the name mahogany is a matter now under investigation by the Federal Trade Commission. The findings of that commission will determine what kinds of lumber may legally be called mahogany in the trade.

Birds Scarce (?)

A notable scarcity of such migratory wild fowl as ducks and geese occurred during the recent fall and winter flight in a number of the western States, particularly in California. Sportsmen and others interested in



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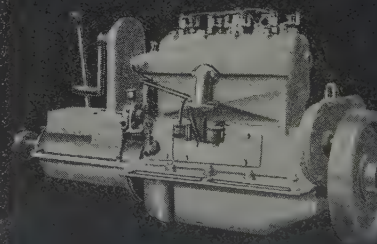
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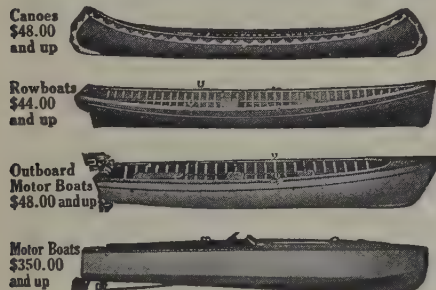
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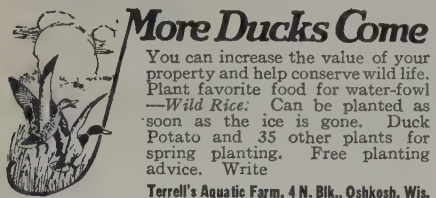
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the conservation of our wild life have expressed alarm at this scarcity, fearing that this indicates a permanent decrease in the numbers of these birds.

The Biological Survey of the United States Department of Agriculture recalls, however, that there was a notably large northward flight of birds in the spring of 1925, and that the situation looks far more serious than it is. The warm winter on the coast of British Columbia and southern Alaska is without parallel. No snow is reported below the 1,000-foot level in the very region of southeastern Alaska where a year ago deer were starving owing to the heavy snowfall which buried their food.

Telegraphic reports to the Biological Survey during the third week of January, 1926, showed an unprecedented number of ducks and geese remaining along the coast of southern Alaska and northern British Columbia. An abundance of ducks and geese has been noted as far north as the flats about the mouths of the Copper and Bering Rivers. From Wrangell, Alaska, come reports of many ducks and geese on the flats near there, and the Stikine River flats in northern British Columbia are reported to be free of snow and ice. A wireless dated January 22 from the Alaska Game Commission advised the Biological Survey that large numbers of mallards and thousands of geese were on the Stikine flats, a remarkable occurrence for this time of the year.

The scarcity of birds in various parts of the west during the fall and winter of 1925 and 1926 does not necessarily mean a corresponding actual decrease in the total number of the existing wild fowl. Mild fall and winter weather in southern Canada and along the northern border of the United States and the deficient rainfall in the west have caused erratic movements among these birds, many of their usual haunts having been passed over by them in the southward flight.

The fact that millions of birds are reported on some of the large wintering grounds in the southern parts of the country is evidence that vast numbers of them have come down from the north.

Catalog on Black Walnuts

An interesting catalog about Black Walnuts and other trees and plants may be had free by any reader of **NATURE MAGAZINE** who will write to Glen Brothers, Inc., at Rochester, New York, and mention **NATURE MAGAZINE**. A line to this effect was inadvertently left out of the Glen Brothers advertisement in the February issue of **NATURE MAGAZINE**.



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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: I have a collection of bird's nests. Could you identify one made of mud, grasses, twigs and a few leaves about five or six feet up from the ground, and one about two inches all around made of fine grass lined with horsehair?—T. P.

ANSWER: Venturing an identification from a brief written description such as this, we believe that the first nest is that of the wood thrush, judging from the materials and the position described. The second is without much doubt that of the chipping sparrow.

QUESTION: Can you furnish me with a list of extinct birds?—C. H. S.

ANSWER: The species of North American birds that have become extinct during the last hundred years include the Great Auk, Labrador Duck, Pallas Cormorant, Passenger Pigeon and in all probability the Carolina Parakeet and the Eskimo Curlew. In addition, several species of tropical and sub-tropical parrots have been exterminated.

QUESTION: Is the Ruffed Grouse a Partridge?—B. E.

ANSWER: The Ruffed Grouse is not, strictly speaking, a partridge, but is called this in New England and other northern states.

QUESTION: How far north do Scarlet Tanagers and Meadow Larks go?—B. E.

ANSWER: The Scarlet Tanager goes north as far as the lower provinces of Canada and the Meadow Larks go north as far as the 54th degree in the British provinces.

QUESTION: Will you please give me the complete list of the planets?—L. H.

ANSWER: There are eight major planets, usually named in the order of their distance from the sun, around which they revolve: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

QUESTION: The piece of paulownia wood I am sending was found in September when I was splitting stove wood. The cavity had twelve capsules made of locust leaves with wonderfully skillful workmanship and deftly fitted into the pith cavity. They were jammed closely together down to where only the last one remains. The capsules were closed with two layers of leaf cut to fit so completely that a hair could not be slipped in anywhere. The most astounding thing about it to me was that the larvae were all of different ages. The outer one was the most fully developed, and so on down to the inner end. Of course we can see the wise provision of Nature in this ar-



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Washington, D. C.

rangement, the outer ones could hatch and get out of the way of the others. But how do they know to put them in this order?—J. U. G.

ANSWER: Dr. L. O. Howard, Chief of the United States Bureau of Entomology and member of our Scientific Consulting Board, informs us that this is the work of some species of *Megachile*, the leaf-cutting bee. The female of this bee cuts circular pieces from green leaves, often of roses, and uses them to line the cavities which she digs in wood, such as you found, or sometimes in the earth. In this case the pith cavity of the paulownia branch formed an ideal place. As to how the bee mother knows enough to put her eggs in the cavity in the right order, if we could answer this we would know the answer to the thousands of other mysteries of wild life, and then, perhaps, the study of Nature would not be so fascinating.

QUESTION: *When does the red and black "woolly bear" caterpillar go into chrysalis state and what is the moth like?*—M. A. H.

ANSWER: The red and black woolly bear is the larva of *Isia isabella*. It usually remains curled up during the winter in some snug place, but is easily awakened by a warm spell. In the spring, after feeding, often on plantain, it pupates in a cocoon made of silk and larvae hairs. The adult moth has a reddish-orange body, with black specks, and yellowish wings washed with pink. It has two broods annually.

QUESTION: *In Maeterlinck's "Life of the Bee," he writes, "for never shall you see a bee collecting or mixing pollen of a different color or species; and indeed one of the chief pre-occupations of the hive is the methodical bestowal of these pollens in the storerooms in strict accordance with their origin and color." If this is so, how is cross-fertilization accomplished, otherwise than by the chance of wind?*—E. G. F.

ANSWER: This statement evidently refers only to the storage of pollen in the hive or nest of the bee. Cross-fertilization, however, is effected by the accidental placing of the pollen from one flower on the stigma of another of the same species, as the bee enters one flower after another in his search. Should the bee happen to deposit the pollen of another species on a flower, fertilization would not take place. This, if it were effective, would be hybridization, and, if it were possible, would necessarily result in a hopeless intermixture of species. Cross-fertilization, the uniting of the male and female elements of the flowers from different plants of the same species, usually results in stronger offspring, even in those species in which fertilization may take place in a single flower.

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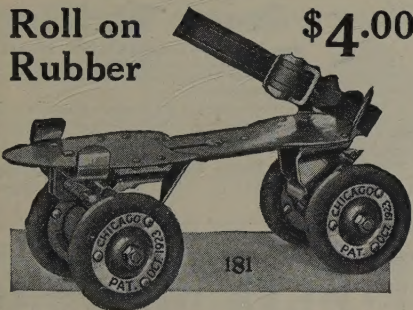
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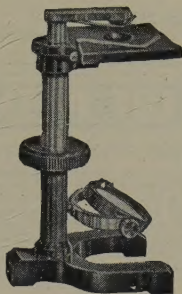
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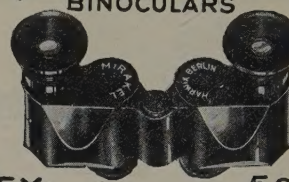
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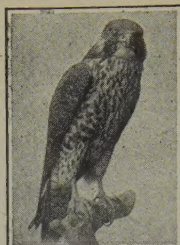
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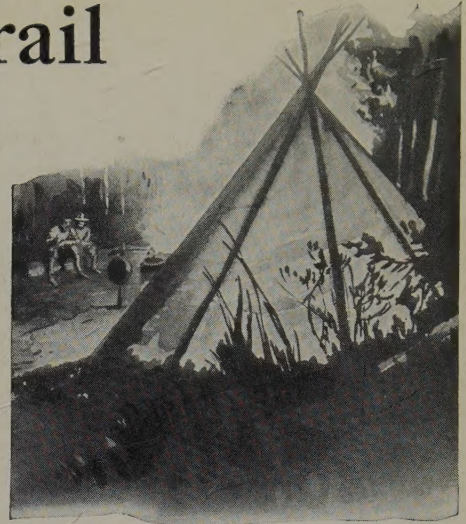
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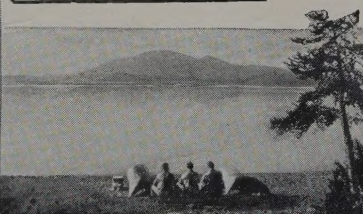
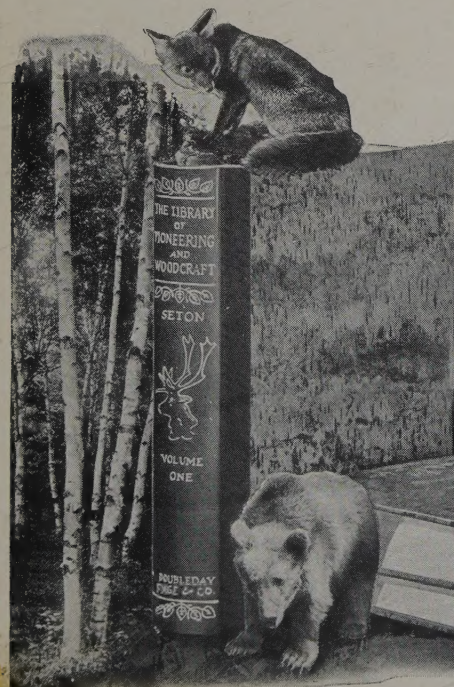
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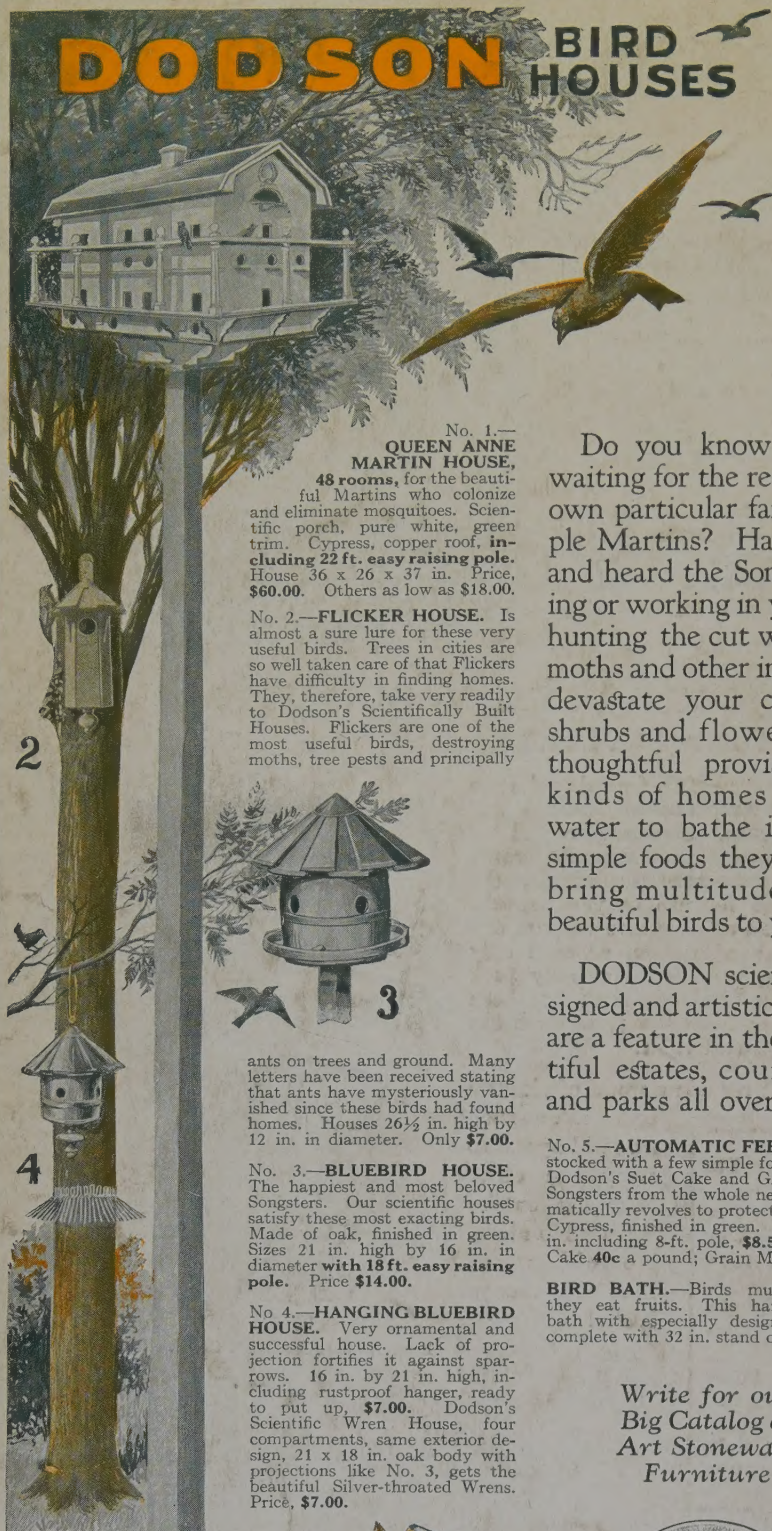
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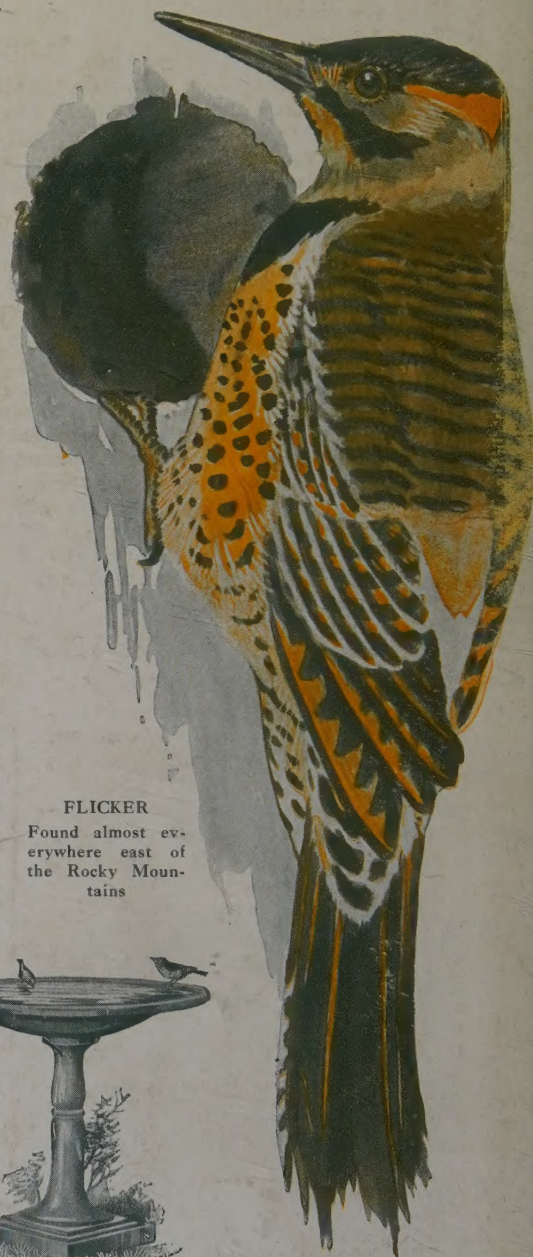
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